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AUTHOR Zastrow, W. E.
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ABSTRACT

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follow--(1) Education Innovation--Impact on Facility Design, by Dr.
Jordan Larson; (2) The Environment for Learning, by Dr. James
MacConnell; (3) Blackboard by Wire Demonstration, by Robert Louth;
(4) The Architectural Challenge, by Forrest Phillips; (5) Meeting the
Challenge of Tomorrow's Schools Today, by Curtis Gallenbeck; and (6)
Panel Reaction, by A. L. Buechner, A. E. Haller, and R. G. Hein. (RK)

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A Report of the

SCHOOL FACILITIES PLANNING CONFERENCE

for

Architects, Educators, Industry

at

WISCONSIN STATE UNIVERSITY

Whitewater

June 14, 1967

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COORDINATORS:

Curtis Gallenbeck
Vice President
School Facilities Council

Wallace Zastrow
Wisconsin State University

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PROGRAM

Chairman: W. E. Zastrow, Director of Field Services, WSU-W

A message from WSU-W President	Dr. Walker Wyman
Educational Innovation-Impact on Facility Design	Dr. Jordon Larson Executive Director, School Facilities Council
The Environment for Learning	Dr. James Mac Connell Director, School Planning Laboratory, Stanford Univ.
Blackboard by Wire Demonstration	Robert Louth Sylvania Electric Products, Incorporated
The Architectural Challenge	Forrest Phillips AIA, Peoria, Illinois
Meeting the Challenge of Tommorow's Schools Today	Curtis Gallenbeck Vice President School Facilities Council
Panel Reaction	A. L. Buechner Program Administrator, State Department of Public Instruction A. E. Haller, President, Board of Education Fort Atkinson Public Schools R. G. Hein Superintendent of Schools Waukesha Public Schools

A MESSAGE FROM WSU-W PRESIDENT
Dr. Walker Wyman

I am happy to welcome so many of you who are concerned with the business and architectural aspects of schools. As you know we have had our problems around here with buildings and budgets the last few years. And I don't know that we're in a position to give leadership on this subject ourselves. We hope that you have found parking and that you have not at least been inconvenienced by coming from the parking areas to this particular facility. I think we have a suspicion that occasionally we lose guests a lot here, in some of these open trenches and other things that we have on the campus but we have never had to face a lawsuit because of it. It would seem very unfortunate to me, Mr. Zastrow, if the planning conference were to have difficulties because of the failure of planning in some way.

Well, as most of you perhaps know if you are from this region, Whitewater is in a rapid state of transition. This institution is growing at a rate that is faster than is good for it. Since 1962 it has been growing at the rate of about 26 to 29 percent a year and to absorb that additional percentage of students each year has put many demands upon staff and administration in this institution. In 1962 there were 3,009 students here who had just completed the year. We have just completed the year of 1966-67 with something over 7,000. We are staffing, planning, and building for an enrollment this fall of 8,300 and for about 9,500 in 1968. We already have accepted something like 30 percent more freshmen for September of 1967 than we did for September of 1966.

So, I suggest these things to you to say that if there is any institution that is pretty deeply involved in planning of one sort or another, this is the one in Wisconsin that has been on the firing line for a number of years.

There is another revolution going on here at this institution and that is in its education purposes and programs. Until 1951, this institution was a single-purpose teacher education institution which had a very old, well established, renowned specialty of business education that had been established the second in the United States in 1913. In 1951, this institution became a state college and it began to operate non-teaching curricula and in 1964 its name was changed to State University and its programs have exploded since then. As of now, we have about 31 different majors in other than teaching fields. We have about 25 majors in teaching fields with a growing number of graduate students so that this revolution is in itself changing the whole basic nature of this institution.

Now, of course, this requires a building program. Buildings on a campus like this are financed through two different sources. First, there is the legislature--through its biennial meeting it makes a budget that provides a certain figure for buildings on these

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campuses, and then all other than classroom buildings are built through the self-liquidating bonds that the income is from student revenues which are sold in the national markets or from the United States Government. As of now, for example, most of the buildings on this campus are not built with tax funds. All the dormitories (we have 16), all the dining halls (and we have 2 outside of another building) and the two student unions or student centers--these are built by student revenue bonds and in time the State of Wisconsin will get a gift of an enormous value when the title passes completely and finally to the State as a gift of the students who use them.

Now, I'm leading up to a point and that is: If you had asked me prior to yesterday, "Is there a long-range building plan for this institution?" I would have to say "no" and while there was such a plan for many years, it has existed in the heads of certain people like the president of the university who has a plan. I suppose almost every other faculty member, and I'm sure a lot of people downtown have plans as to where this institution should go and build and in what direction. There is an officer in the Board of Regents office in Madison who has the title of "Planner for the State Universities," there is an agency in Madison called the "Bureau of Engineers," which legally has the authority over all building for the state universities and other public monies so that probably the outright answer to "Is there a plan?" is that there probably had been many plans. But in general, I would like to over-simplify the planning of the state universities by saying that, in the main, we have done what I would call "pipeline planning"; that is, we have so much money for our building--it's a million dollars or \$3 million. Where can it be put? Well, there is money broken down by the building commission that says that \$200,000 of this may go for utilities, therefore, we can put the building where that \$200,000 will take the pipeline, the heat line, the water line, and those things. Unfortunately, we have done a lot of "pipeline planning" in the state universities. We are a little more sophisticated than that now; but yesterday there came to my desk a thing which is called "The Whitewater Plan." I don't mean to feign innocence about it because I was involved in it--planning--but there has been a firm in Grand Rapids, Michigan, that has drawn up a long-range plan for this institution. They collected \$20,000 for the job and it is now on my desk.

So, I say to you that maybe we are totally unsophisticated on planning of buildings and the development of campuses and the like which you are concerned with but I would say, at least, that we are not too proud of the long distance, long range planning that has taken place on any state university campus.

Now I think there is great need for planning and I think that's what you're much concerned with today in your conference. I think

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there is a relation between student unrest and our types of buildings and types of educational practices that we have. I think that this is going to reach the high schools and maybe other schools within a reasonably short time so that I think that all people in education are going to have to face up to this problem some of these times as to what this student unrest is all about. It's pretty easy to generalize, the way most of us are doing today. But anyway, the pressure for budgets and all of these things are going to force us to use our resources as wisely as we can; and, in the final analysis, it seems to me, that's what planning adds up to: a wise use of resources. And I also have to believe as a matter of principle that when you're planning, beauty doesn't cost anything. You can have nice looking facilities and well developed facilities for the same cost as you can have anything else.

So, you are welcome to the Whitewater revolution. It has been a pleasure to know that you people would honor us by your presence. We hope that you will profit from your conference and I hope to sit in on some of it so that I can learn more about what this is all about today, too. Thank you.

This speech was given at the School Facilities Planning Conference held at Wisconsin State University, Whitewater, on June 14, 1967.

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Dr. Jordon L. Larson

Thank you, Mr. Zastrow.

Dr. Wyman, fellow educators, architects, members of industry, and other guests present. It's a real pleasure to come to Whitewater and meet with you and share with you this conference that has been set up so well by your committee under the leadership of Mr. Zastrow.

I have a little affection for the State of Wisconsin in that, oh, for at least two or three reasons. My grandparents were immigrants from Norway over here some 120 years ago and I have two great grandmothers who were born about 1790, died of the cholera epidemic in this general area--Milwaukee--in 1854 and buried in unknown graves in Fond du Lac, my father-in-law in Adams County and started a school in the State of Wisconsin. So we have a number of relatives in the general area and coming from pioneer settlers in this state, I have some affinity for that. Then, secondly, 40 years ago I was superintendent of schools in the town of small consolidated schools in the small town of Dunkerton, Iowa and my neighbor, superintendent of the next consolidated school just by was Bob Williams--R. C. Williams--who was president of this university for a number of years. And we were very close personal friends as we were almost starting out and he was a senior to me by maybe ten years but we were very good neighbors and I always admired the fine educational philosophy of Dr. Williams. He was one of the finest men I have ever known. So I have some affection for this college and university and for the State of Wisconsin.

My topic this morning on educational innovation reminds me of the story this early in the morning of the two duck hunters. One was a coffee drinker and one was a whiskey drinker. The night before they were going duck hunting, they got together to get ready to go duck hunting the next morning. The coffee drinker drank half a dozen cups of coffee and the whiskey drinker drank--well, as much as he could out of a fifth of whiskey. So the coffee drinker says, "How can you see anything when you drink whiskey?" "Well," he says, "I don't know. I see pretty well but how can you keep awake when you drink so much coffee?" So they got arguing a little. Anyway, the long and short of it, the next morning they would go out and meet at five o'clock in the morning. They went out to the blinds about a hundred yards apart and lo and behold, one lone duck came flying overhead above the blind of the coffee drinker. He took a shot and missed it, emptied his gun, took his three shots and went over to the blind of the whiskey drinker and he fired and the duck came down on the first shot but he kept on shooting until he emptied his gun. Well, the coffee drinker dashed over and said, "Good shootin' there, fella," he said. "But, how come? You hit him on the first shot but how come you kept on shootin'?" "Well," he said,

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usually in a flock that large, I get three or four."

Well, sometimes this early in the morning we don't know if we see double or triple or what.

Then I'm reminded of the passing of time. About 40 years ago I would jump out of bed and open the window and throw out my chest and say, "Good morning, Lord!" Now I turn over in bed and let gravity bring my feet down to the floor. Instead of patting my chest, I scratch my chest and I go over and close the window and say, "Good Lord! Morning!" Times do change.

I've been thinking about this topic because I just don't know what innovations are any more. Many times we think what we think of as innovations are really old time things. Some three years ago a committee at Columbia University, where I got my doctor's degree, said, "We'd like to have you serve on the committee." Well, of course, you're always on some committee. So, well, what is it? Fine! What is it? Well, it's a committee for the ungraded school. I said, "What you want that committee for? What is it supposed to do?" We're going to study and find out about it. "Well," I said, "Find out about the ungraded school? I'm a product of the ungraded school," I said. "I never was in any grade until I was in the ninth grade." And I thought it was an awful jump from zero to ninth grade. I said, "We spent a hundred years getting rid of the ungraded school and now we start up something new--it's an innovation to have the ungraded school. All of the elementary schools, the rural schools, of a hundred years ago were ungraded. They permitted you to study in there and you went as far as you could and there was no grading. You just went to school. And that's what I did. In fact, the year I left country school for high school in a small town in Iowa, that was one of the last counties to go graded. In other words, they were authorizing grades in the rural schools but it was up to each county superintendent. That superintendent had been there since 1900 or before and he just wasn't in any hurry to change so he changed the next year. But some of the schools were graded. Ours wasn't so I was a product of the ungraded school and now I should study something about this new innovation--the ungraded school.

Then I was called up one time about the time I was president of the ASA. Somebody called me up from New York--up county--and he said, "I know you, maybe you don't know me, but I would like to get your opinion. What kind of writing are you teaching in school?" I said, "Written writing." He said, "Written writing? What do you mean?" I said, "All writing is written." "Well," he said, "our town has a problem." I said, "What's your problem?" He said, "Our town is having a big battle up there whether or not they should have cursive

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writing versus manuscript writing and our town is split wide open on that topic." I said, "Well, can they write legibly?" I said, "After all, it seems crazy what kind of writing you have when you don't know what either one means." And then I said, "What do you know about education? Why don't you forget about these little parts of discussion and get back to good, sound education."

Well, anyway, there was something that you had to have one or the other. "Frankly," I said, "we do have a little of both and," I said, "I don't care which is which. It doesn't make much difference. But we put titles chalkboards or we put new names on something old and we say that's an innovation. I say it isn't. It's just window dressing and we have to watch that sometimes when we talk about innovations. I would rather say that we were going to talk about innovations, let's talk about meeting the needs of the changing times. If there are things that we need to change for or to permit to use in education, that should be what we would call rather than innovations because I think that sometimes these innovations are really just new monikers for old things we've been doing for years and years and I think sometimes we have to be concerned about that. I remember we were talking about some of these core curriculum topics. Well, that was quite a novel thing in 1928. I know I was doing graduate work in 1928. We were talking about core curriculum then. Now somebody says it's something new again. Well, of course, it died down in the thirties and started back up in the sixties and was a new thing--core curriculum. It's nothing new at all. In fact, many of us have been doing it all the time.

And then they talk about team teaching. We were doing team teaching back in the early twenties. We called it the platoon school. We platooned the teachers. Now they use platoon football and platoon baseball. But we took teachers then and had all teachers teach math in the elementary grades--I did that for 20 years or 19 years in Mount Vernon, New York. We didn't call it team teaching. We had our organization. It was a highly departmentalized program and if you say a highly departmentalized program you've got the same answer, almost, as team teaching. And here we've got a new name for something that's been going on for over forty years that I know of. It's not new. Some aspects of it might be--yes, but, after all, we've been doing many of these things over the years that are now called innovations that aren't really innovations. I would rather say that whatever kind of a program we want in our schools, whatever kind of an organization we want, we ought to be able to do in the facilities we build or construct. We ought to be able to adapt new facilities to new programs and particularly in the field of science and technology because that is the area in which we have to be more concerned in dealing with the general topic than perhaps just organizing a social studies program or something like that.

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So the point is, perhaps we need to think of something else than the word innovation. Rather, let's say let's meet the needs of the changing times and whatever kind of flexible programs we want to put in, let's provide flexible construction and flexible facilities that will permit the adaptation of any kind of a facility built to any kind of a program we want to put over within due reason. We can't go out and say, well, now we're going to put a planetarium in this room here. Things like that we'd have to be a little judicious about in our judgment. But, nevertheless, we should be able to put into effect any kind of an educational organization or program in the kind of facilities we construct. And I think that if we say that that is the thing that I would like to present as a part of our innovation or the educational innovations and their impact on the facility design. And I think if we're abreast of that, we will do a good job in this whole area. One of the things I think we should be concerned with, too, is what part of our facilities and how much of the facilities should you include in this overall aspect of flexibility and that will vary. There are some things that you don't need to vary very much. If you have an auditorium like this, why you wouldn't expect, perhaps, that changing very much although you might be able to put folding and operable partitions in here and use some of this for classrooms. That sort of thing could be a flexible arrangement for auditorium use. Or, you might want a multi-purpose area of a "cafetorium" where you might use something for multi purposes and getting maximum or full use of the space that you are trying to use in your schools or colleges. And I think whatever we say about schools, it applies equally to colleges or universities or junior colleges or the like; because, after all, we are talking in general terms about adaptations of facilities to broad educational programs that we'd like to put on as educators and you architects should try to interpret as best you can what we want these facilities for. It's a question, many times, of what do we want to have these facilities do for us in education. I think that's one of the important things we ought to keep in mind.

I do have some written materials here and I think perhaps I might read some of it just to see that I keep myself oriented a little bit to the topic, and better, perhaps, than I might otherwise. And I will say this--planning and designing educational facilities functionally must be geared to meet not only the needs of today but for the future--as far ahead as we can calculate or reasonably well predict such future. We should, at least, hope that this calculation would encompass the life of the school bond issue or some twenty to thirty years. Whether we like it or not, we are living in a push-button age. We push a button to run our elevators, to operate our radios, to open the garage doors, to deliver food and drink from the automat, to turn the wheels of industry and to perform innumerable other tasks previously done by hand. We have sent satellites, geminis, and missiles into outer space and manned them by push buttons from the ground or from seacraft. We have, in

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like manner, sent and received messages from vehicles we have placed in outer space--Telstar. We have recently sent several of our fellow Americans out in the great space beyond the earth at a speed ten times faster than that of a rifle bullet with push button ease and amazing accuracy. When we land somebody within a fifth of a second of time with all this maneuver around the world, earth and land him within a portion of a second--distance, of course, being so fast that we hit 'em pretty close right to where we wanted them to land. That, to me, is an amazing accuracy of our scientific skill. We can but dimly imagine the impact of this aerospace age on our educational program and its potentiality for facilities to permit the appropriate adaptation, functioning of such program. We need the best minds of architects and engineers, of educators and planners, and of business and industry and of other interested citizens to accomplish this gigantic objective. We cannot use a common denominator in planning school facilities without taking into account what the numerator is. Too many schools are being built based entirely on the factor of cost. Likewise too many schools are obsolete before they are completed. We cannot start our planning with a yesterday view and look back twenty to thirty years. Rather, we must begin with today and look forward at least twenty to thirty years, if not further. We must consider carefully every new idea for school planning and school construction. All the works or functions of education carried on in any new building will be accomplished in the future. In fact, everything we say this morning will be accomplished in the future. We, therefore, need to assemble the best know-how we have at our command or which we can secure to make the best possible calculations of the future before we proceed to design schools and colleges we need to build. In this aerospace age for which we are planning our school facilities, we must not let ourselves be up in the air but, rather, keep in mind what is apt to be up in the air and at the same time keep our feet on the ground. Regardless of what our educational program or specifications should provide for the challenging years ahead, there are some basic factors in planning that are essential for any school or college program which all of us would insist upon. Whatever it is, it must result in quality education. To secure quality education, we must provide the kind of school facilities necessary to stimulate its achievement. Regardless of any school program, we must answer effectively a few simple questions and apply them to each area of instruction.

First, what facilities should we provide our young people that will be most conducive to learning and most likely secure from them the maximum learning potential. These children are also in this push button age. In fact, to them it's automatic. They didn't know that there was any other age. You ask some youngsters today about the days before television and they think that's ancient history. Yet you and I know that just a few years ago we didn't have it. It is very recent to us but to a youngster who is fifteen years old, he doesn't remember any life but television life and I

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think we're going to have to adapt ourselves shockingly to a period which is normal to children but to us is almost amazingly fantastic even now. They must learn ten times more and ten times faster than their great grandparents did to keep abreast of the normal technological advances in their day to day living. By comparison, over half of the jobs today did not exist even 35 years ago. Our use of consumer science has more than doubled within the past 25 years and the speed of travel has more than doubled doubled several times in the past decade. We don't realize just how fast we are changing these things here in this world of ours and especially in the scientific world. And to those of us senior citizens, at least, we have seen, we have visualized, this whole change of living science from the horse and buggy days to today that is really a fantastic thing. And someone has said that more science has been developed in the last ten years than in all previous history combined. Well, there seems to be a lot of truth in that, and we probably can advance in the next ten years even more than we have done in all previous history combined up to now. So, we are moving fast and we're moving--I don't know how well we're moving-- One of the weaknesses I think we have is maybe we're learning science too fast and humanities too slow. With so much to learn and in so little time, we must create the kind of learning environment for every child that will permit him to function at maximum capacity for the optimum length of time. Our primary objective, then, is to provide the best learning environment we can have. And you'll hear from Dr. MacConnell on that so I will not touch upon that any more because he is covering that topic later on this morning. I'll skim over that.

Although closely akin to the learning environment, we need also ask ourselves what facilities should we provide our teachers that will be most conducive to effective teaching and that will best secure the returns for our children from our investment in the teachers and in teaching. By far, the greatest investment in education is the classroom teacher. The costs of teaching are at least ten times the cost of school facilities spread over the life of the building. This probably is a favorable or desirable ratio. Nevertheless, we must constantly and continually point out the false economy of saving one or perhaps two cents on the school facilities dollar on the one hand while on the other causing a loss of from ten to twenty cents in teaching efficiency. This is penny wise and pound foolish.

The real measure of the cost of a school and its economical planning lies in the efficiency of its teaching by the teachers and of the learning by the pupils. A good learning facility creates a good teaching facility. With the complexity of our society of today and the potential acceleration of that complexity

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in the years ahead, we must realize that to do a good job of teaching, we must raise our sights immeasurably toward providing more and better facilities for all our teachers than we ever thought about before. We wouldn't think of providing a cheap hammer or a cheap saw for a good carpenter. We're too smart for that. Rather, we would also want him to have, by all means, certain power tools so that he could perform more efficiently. Yet for the teacher we have too often dismissed the thought of providing her with the necessary tools for teaching by saying, "Oh, let her improvise or use her imagination," or "When I went to school, these teachers didn't have all these tools and I got a good education." You've all heard that too many times. We couldn't get away with that statement with a ten-year-old boy but as for the teacher, that's different. The quality, type, and amount of teaching aids or materials are increasing in value to successful teaching parallel with the advances made in science and technology. As noted in industry, where greater investments than ever are made in tools and equipment for each laborer, so should a similar increase be made in tools for teachers. One could mention modern laboratories for science and mathematics, for foreign language, for fine arts, for music, for industrial and practical arts, for vocational and trade training, and for all the areas requiring special equipment and materials essential to accelerate both teaching and learning and to attain an acceptable quality of both as well. We need more teaching materials today than we ever did because when I was in the country school--this ungraded school that I went to, and I probably show it--we had for a globe an inkwell and the teacher would take that inkwell, and usually it leaked a little bit and if you handled it you got your fingers a little black too, but they tell about the world is round. Well, I always thought of that inkwell. Till I was fifteen years old, I didn't realize it was a globe. And I guess it didn't make much difference then, whether we used that inkwell or not because we didn't know much about the world. We didn't know much about the world until World War II and we saw the fine photographs of maps and stuff in all the newspapers and we began finding out where these places were that we'd heard about as kids and thought they should have been destroyed before they were built so we wouldn't have to remember these awful names. I remember studying Greek history and I thought that none of those fellows should ever have been born because I couldn't pronounce their names and I didn't care whether they were born or not anyway. We weren't geared to bringing the world history to our own current living. We are today. We have been, probably since World War II so, again, we've had with television and with maps and so on and all these illustrations, we have learned a lot about history. I think some of you are old enough to remember World War II. You know, that's a quarter of a century ago now. It's really old time history. When you're a veteran of World War II, you're really an old man and I'm old enough to be a veteran of World War I as well. But the point is, we saw places in World War II on these maps that we'd never heard of. We maybe heard the names but we didn't know what they were. So I think this world has

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become smaller because of speed of travel and of communication that is required now of us as teachers much more materials to show these youngsters, to demonstrate and illustrate what we're trying to say that wasn't so necessary when I was a boy because I don't think we cared so much about the rest of the world anyway. We were pretty much in our own bailiwick. So we have now a requirement for much more teaching material than we ever had before. Now I think industry has proven that in the tools and equipment they are providing for labor which has gone up immensely and now the investment for labor is really terrific in the industries. And, of course, to them that's economy. And if we want efficiency, part of efficiency is the economic use of time. If we're going to get the best teaching, let's give them the materials that will create the best teaching. Give them the teaching material. And I think the cost factor is minimal when you compare it with what results you can get. In other words, let's measure efficiency by what results we get rather than by cost of--well, I have so much in the budget. Of course, sometimes we are handicapped by budgets. Everybody is. Handicapped in several ways, because sometimes your budget almost has to determine what you can do rather than what you would like to do--and then let the budget come later. To get the sort of things you need, you almost are forced by, especially in the state institutions or where you have appropriated funds, that's all you can spend. So you almost have to work backwards from the amount of funds available. Now, we in teaching, we have not done enough, I think, we administrators, in selling our communities--school boards and all--our communities, on the value of these things as pertain to increased learning--increase in the quality of education. We have not talked about the end result so much as we talked about costs--which, I think, is completely in reverse of what it ought to be.

We need to consider new products and new ideas that may be superior to the present with little or no increase in long term costs, such as the possibility of vinyl wall covering over gypsum board in lieu of plaster, of total energy for lighting, heating and cooling, for floor carpeting, or for newer and more resilient vinyl tile. The vinyl tile people woke up when they got a lot of carpeting coming in and I told Harold Gores, president of the Educational Facilities Laboratories, "you got a lot of carpeting coming in." In Atlantic City this spring, he said about ten years ago the floor carpeting market in the United States for schools was about \$64,000 and the last year he had information on was 1965. He said that year they had spent \$64 million for carpeting for schools. In other words, we have gone from \$64,000 to \$64 million in 8 or 9 years in use of floor carpeting for schools. Then immediately the tile people got busy and now they've got resilient vinyl tile. In other words, they've gone into some of the resiliency

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there, which is very good. Competition improves our manufactured products, and of course again the carpeting ten years ago was no competition. Now it is, and so we've got other facets. And of course the matter of acoustics out of the whole thing. I'm not advocating one or the other. As I say we ought to consider new ideas, test them as best we can, because new ideas are not always good; just because it's new doesn't say it's good. However, I think we've got to analyze, evaluate, and assess quality out of these things and if they are usable, architects and school administrators and college administrators should try to adopt them and adapt them to modern facilities. Now we have many kinds of educational hardware. We say "harnessing hardware" today is one of the big problems of education. We have high power salesmen, we have high power equipment that's being constructed and built. We have high powered salesmen selling. Now, some of this may be excellent, and most of it probably is good. However, I think we need to again assess real values and not probably buy something that is a gold brick or something that turns out to be very little long term value. So, we need time and we need experimentation, but we also need evaluation on these things including computer use and so on. As our educational programs are now, we need to gear our schools to these modern inventions--and "hardware" we might call them so that we are at least ready for acceptance of them. With federal monies and state monies now for these things, of course, we are encouraged to secure better teaching equipment. If it helps the teaching, I think we should give every support we can for it within due bounds of judgment and finances. All of these new things should receive careful consideration by school administrators, architects, and by the governing boards of our schools and colleges.

We need to plan our schools with a major view of pupils and teachers in mind. That view is taken from being on the inside looking around and out rather than on the outside looking at or around the school. Whatever aesthetics we secure on the outside, we ought to secure many times more the functional aesthetics on the inside. For those working in the Pentagon, the Rockefeller Center, or the Empire State Building, few are seriously aware of the exterior beauty or lack of it. But all are concerned with the area in which they work and with the bodily and mental comforts available in the place in which they work. Thus with teachers and pupils. Another major concern in the designing of schools is the problem of meeting the needs of the changing times. This may be relatively simple if the educated would prepare a set of educational specifications that could be projected far enough into the future to allow any possible or conceivable change. Thus far, however, it has been difficult enough to get a complete set of educational specifications for the present school program let alone the future time. Hence, we can't expect any perfect guidelines for the future. At best, we can only make a good guess.

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Times can and do change quite rapidly. The miracle of yesterday is commonplace today. We are ready to believe that man can accomplish anything he sets out to accomplish. How then can we plan the unpredictable future with our present know-how. We can best do this through a structural design that will permit as much change as possible in the educational program. To the educated, the building should adapt space to program changes or to multi-purpose use. It is often referred to as flexibility. The more uncertain we are of the future educational program, the more flexible our school structure must be.

Now I have listed a few points that perhaps may help in our thinking of this and I'll just quote some of these. To permit (1) the maximum freedom of choice of programs by the educators; (2) change in educational programs--that is, from pre-school to vocational-technical to adult education and others; (3) changing the teaching methods and procedures.

Now, rather than team teaching, I would use the word "cooperative teaching" because it is a cooperative event and it doesn't give you a title that you have to worry about later and it becomes a dirty word. I remember years ago progressive education got to be a dirty word. Well, when you asked a dozen people about what progressive education meant, you got a dozen different words. Nobody knew what it was. I still don't think you know and some that don't want to remember.

But, nevertheless, we have a cooperative system of teaching where you can use your talents in the best manner you want to use them whether it is a group, larger group, smaller group or co-operation. That, to me, is a better term than team teaching because team teaching--if we haven't been team teaching, what in the heck have we been doing all these years?

(4) To permit change in material of instruction, new inventions and improvements such as planetariums and scientific things that we need to provide for electric outlets or adjustability to increasing capacity for electric outlets and that sort of thing that will permit the use of these things if you want them. And that, of course, is something that architects are capable of designing well. And I say then to permit harnessing the hardware, that is, the teaching tools and the utilities for those things.

(Point 5 is not given by the speaker.)

(6) By changing organizations to permit changing organization patterns. Organization, over the years that I have been in this business, proved very little. All I say about organization is organization of schools is an administrative matter and it should

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include administrative efficiency. But as far as anything since then, I have never seen much change as a result of education. You can have any kind of organization you want. You have 633 and 842 and K6 or 633. Organization doesn't mean much. They are administrative convenience and might work well on one committee and not so well on another so I'm not concerned about organization. But you ought to permit the kind of organization that is desirable in that particular school or college system. In other words, if you can change it, all right.

Sometimes we don't have enough space also for administration purposes and I think that now we need more and more for that because we are getting more and more assistance in the areas of special help, special teaching, testing, etc. We need more space for that than we ever thought of before. We need more library space than we ever thought of before. Many schools, until rather recently, didn't have libraries in elementary schools. Now we feel there ought to be a materials center, a library, in every elementary school. Well, I would call that the "permit ease of changing space for multi-purpose" or to adapt to something that is akin to what is there but still could be usable by the educational program.

To permit changing environments for learning--that is the listening devices and comfort devices--that will be taken up, I'm sure, more in detail by Dr. MacConnell.

To permit changing community needs--I think we have an unusual thing about our communities. We find now, more and more, that the adult evening schools are being improved and increased over the country and I think we find that education doesn't stop when you're through with high school.

And, of course, the areas of communities--we have changed communities. You take the suburban area of Chicago where I live, we have some of those industrial centers coming out there by the hundreds. And, of course, from a purely residential community, now you find some of these communities are largely industrial. Well, that's a changing community need too.

And changing population. Now we have a mobile population in the United States. It started mostly in World War II. Right now we have 30 million move each year to another home in the United States according to the 1960 census. We have 20 million that move to a new location. We have 5 million per year that move to a new county, and over 5 million per year move to a new state. That's a mobile population. Thirty million people each year move to another home and of those, 20 million move to a new location. Just think of the mobility of our population. We may have one community

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today and in ten years our community may have a different pattern entirely.

To permit the expansibility of the building and utilities--that is, with as much rooming of your schools and colleges, what provision are we making to permit expansibility of certain buildings or expansibility of the campus. Are we setting up for expansibility of the building or the complex?

To permit the increased learning potential--that is, improved space for changing ease and so on. In other words, are we permitting the increased learning potential by various devices, one as freely as another?

To permit reducing time lag in construction--one of the worst things about building schools and college facilities, we're always in a hurry. We got a rush job. In fact, I had some very bad experience--it turned out to be fairly good experience--I learned something--but I lost four bond issues in Mount Vernon, New York, before we won a successful building. However, each time we lost a bond issue, we improved the plan. We went on and increased the plan and increased the cost till we were ahead of our times. And I sometimes think maybe we caution ourselves. The people weren't ready to admit we needed a new high school till we started double sessions--then we voted fast. Then they said, "Hurry up and get it built." Well, we had our plans all done so we didn't lose any time in planning. But the worst thing that can happen is (but we can avoid it) is to rush through a building program so fast that we don't give the architects time to assimilate all their know-how and use it, or the administrative group and their staff to put forth the proper planning that ought to go into it from an educational standpoint, or to set up the kind of a program or performance or specifications that the architects could interpret well in putting their plans into effect. Now that's the sort of thing we're always in a hurry.

Well, now, we can and we have, some devices have already been developed in the construction field that you can build schools faster today if you use certain designs and some of the representatives here from industry that have been able to expedite the construction of buildings. But I think we should always say this: Don't rush if you can possibly avoid it. Allow ample time for planning of a school facility or a college facility. Sometimes you can't if you double your population in four years. Here at Whitewater I can see where, gosh, let's get something up and, of course, that hurts the planning. Sometimes maybe not as badly as we could expect but it doesn't help good planning. And I think if

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anybody could say slow down on the schedule of time for planning a new facility to permit all these things to be studied that you may want to study, and some of these things will require extra study because if it's new, if it's an innovation or something really new, you want to try to evaluate it the best you can but you can't just say, "Well, let's get this done," and give the architects three months to get the working drawings done and so on. Well, that's ridiculous.

But we are under pressure too many times to get this school building and somebody says, "Can you get it ready for September?" And, of course, some of the industries say, "Well, all our orders want to come in in August. Everybody wants all their stuff in August." Well, they're working 12 months a year. They're trying to keep the industry going. So, it's expensive. They have to either warehouse their stuff or build ahead for it and it costs us maybe 7 to 10 percent more because we are always in a rush. So it isn't economical either.

Then I would say, finally, flexibility should permit a continuing progress planning--that is, to meet the needs as they may arise and to be ahead of the mob, so to speak. Because, it's like one of those--well, how do you get along? He says, "I just see which way the crowd goes and I get in front of 'em and run like hell." Well, sometimes, that's the way we plan things. We see what the crowd wants and then we get in front of them and act like we're leaders. Actually, we aren't. Or throw a feather up and see which way the wind blows it and then go in that direction.

Well, there are certain education areas that will permit program changes or innovations without any changes in the fixed or room space. A simple change with movable equipment will often do the job. In other areas, however, where space needs to be enlarged or additions of utilities are required to provide for larger classes or cooperative teaching or where science needs expansion, provisions for such possibilities should be planned when the facility is originally being designed. If you properly plan for such future changes, prime consideration should be given to the minimum time and to the cost of such change. Aiding in this would be using operable or movable partitions or easily removable non-load-bearing partitions. Accessibility to electric and plumbing services and to the simplicity required of whatever labor services are involved in order to make the needed changes as quickly and as economically as possible. Sometimes he says, "Oh, yeah, we can change this wall here, yeah, sure." Well, if you gotta have a contractor in here and a set of specifications

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and award bids, you've really got a job. You ought to have as simple, in changing things--a facility, as anybody with a normal grade education could handle without a lot of extra specialized help such as plumbers, carpenters or masons or what not. So simplicity of the changing spaces is as important as the ability to be able to change--sure we can change spaces. We can go through that wall if we want to and find something on the other side and we probably can do something with it but that might cost so much that it is hardly worth the effort and most school administrators and officials would say, "Well, that costs more than it's worth. We won't do it." So we want something here when you want adaptability to change that can be done economically and efficiently that can be justifiable as an expense, too, as well as justifiable from the standpoint of a new program or changing program. Such areas requiring space changes within the building will normally not exceed one-third of the total space. Now, that may be debatable. I don't have any final answer on that but there is certainly a large portion of any building which doesn't require too much flexibility--certain areas which are pretty much stable. If you have a dining room or cafeteria in a high school, the chances are that you will keep that pretty much a cafeteria. You might have multiple uses for it but to say that the whole building has to be flexible and every wall has to be movable or operable doesn't make sense. But there is a certain area which can be worked out and ought to be worked out by the educator in advance. Here is about what we want here for this area for flexible space. This you can build with solid walls or load-bearing walls if you want to. But I think that could be determined but it would be less than half and I'm just saying that normally it would not exceed over one-third of the total space. On the other hand, should the student population growth require additions to the building in the near future, the design could indicate where such additions will be made. They ought to be dotted out and the arrangements should be made to include adequate utilities to care for such expansion. Should such expansion appear imminent within a few years required by changes in the educational program, they should be provided in the new addition where feasible. Sometimes you might get this flexibility in the addition that you don't have enough of in the old, the original construction. This would avoid the expensive changes in the original building.

A third major concern is structure. The design of the structure is basic to achieve both flexibility of programming and to keep costs to a minimum. To achieve the optimum in both can come from using a marginal design with long span construction with a minimum number of columns. Probably the newest ideas in this area were developed in California through the School Construction Systems Development Plan or the SCSD as it is frequently called. It is

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both sound and economical to use as many standard components in the structure as possible. By using a marginal design, standard lengths of steel, standard forms for concrete, standard doors, windows, unit heaters and ventilators, wall cabinets, ceiling lighting components, operable and folding partitions, plumbing and other components so far as feasible or practical, costs can be kept well below any other design where too many special materials or dimensions are used. Using standard components does not impair the freedom of the architects to utilize their skills and individuality in the aesthetic or architectural solutions nor to prevent them from giving personality to the total structure. We did one thing in our Mount Vernon High School which we built and got into in 1963--it was the largest then completely air conditioned high school in the world, at about \$8½ million cost for 3,000 students. But there we used the same size of unit heating-cooling device in every room. Now the plumbing contractor, heating contractor, said this is the best thing that's ever happened. I'd never thought about that. Several hundred units. Our men set this up and bring in our top layout man and we get the dimension--same in all rooms--these people delivering where you have different size radiators in the old system, they always had so many square feet of radiation here, another radiator smaller in each room. He said, when he got up, some of these men can't even count up to three, some of them can't tell the difference in these radiators. So he says if there are three in a room--one, two, three--they can put them in there. So when we had different sizes, he says they were always moving them back and forth, hauling them all over the place, and trying to find the ones that are supposed to fit this place. And then just setting up the pattern of installation was so simple. Now with thermostatic control, if a radiator is a little over size, all right. Let it be a little over size rather than under size. But the simplicity of that made some difference. Also we had repairs and we got a couple of standard extras--just put them in the school for replacement or for maintenance use. You've got everything standard. The same with windows. Now I think any of you who ever remodeled old schools, measuring the doors--I think every door was different--and I think you would find ten or fifteen different dimensions of windows--how they did that in those old days I don't know--but they sure were master mechanics at giving different dimensions. Everything was different--nothing was standard. Now standard lengths or standard heights of windows or certain things like lockers makes sense and it doesn't hurt the overall composition of the structure. Use of standard components does not mean use of a stock plan. I want to emphasize that. The attempt to promote stock plans in New York State proved a total failure. Our governor was quite ambitious to get out stock plans to save money. Well, they got some architects--I knew several of them--two of the group who had been selected had been our architects

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in our own school and they put out a stock plan for a senior high school, a stock plan for a junior high school, and some elementary schools. And not one of the architects that did this work for the state recommended that it be used state-wide--not one of them. In fact, it was even cheaper to custom build than to build them by stock plan because there were so many adaptations they couldn't adapt a school to every situation. Site matters--and there are many other matters, you know, that affect the planning and design and they didn't save a nickel. Not a school in the state has adopted it--that stock plan. I have no use for stock plans. I do think we can use many stock components. If we were building something of lumber, all of us would know that there is lumber of certain dimensions--a standard like two-foot lengths and so forth and so on. We would do things as much as we can within reason with the stock components, standard components in structure.

Each school, of course, should have as much individuality as possible. They should fit into the community characteristics, its history, its people, and its surroundings as much as appropriate and feasible. There are many special factors that affect the design of the structure. In the more open country where large sites are readily available and reasonably priced, a one-story building may best suit that community. In larger cities where the little land that can be secured is so costly as to be almost prohibitive, serious consideration must be given to two-story structures or even high-rise buildings of several stories. Whenever desirable sites cost far in excess of 10 percent of the total project, alternate choices may have to be made, both as to site and design of schools. Special problems, such as vandalism, may affect the design of the school. In New York City, for example, some of the newer schools are practically vandal-proof. Now, they've been spending over a million dollars a year for just window breakage in New York City. Chicago has over half a million just for window breakage. Now vandalism is almost wholesale in the larger cities. New York is building some schools with solid mason walls on the outside and have the play court windows on the inside--a court like a block square with their play area on the inside. And, of course, they can probably keep them from getting in there at night and you can't smash a brick wall very well but that is a cost factor, a community situation factor, that may determine that they need vandal-proof buildings in certain areas. I believe if I were there, I'd build them because in the vicinity of my school district which bordered New York City on the north and, especially adjacent to the New York City line, we had window breakage in a few schools there that was clear out of reason for anybody living in the midwest. You wouldn't believe it. It is hard to comprehend--the lack of consideration for public buildings in the big cities.

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Climate, too, is a factor. In San Diego, for instance, where there is little cold and little rainfall, outdoor play areas can be utilized over 90 percent of the time. There are some schools out there in San Diego County with all outdoor gyms. Well, I said, how much time-- Well, they said, we lost three days last year. Well, now, that's the weather. That makes for different construction, a different plan, too. In colder climates, however, indoor play areas must be provided and conditions, such as climate and rain, are seldom alike in two school districts. There are great differences even within the same area in the same state. How should we expect to have all schools cost the same, even in a similar climate? We need pilot school districts to help set goals higher, perhaps, than others are set. We need a few daring communities that dare to be different and dare to be experimental. We need all types to stimulate our growth and development and to help utilize the newer and better in school facilities. It is this local pride that has made our American schools so great and the envy of the rest of the world. And I have visited schools in over twenty countries myself and I can attest to that. We need to steer the architects and the school officials who, like the military field commanders, take calculated risks to achieve their desired goals. We need to cheer the producers as well for it is they who spend large sums of money on research and design to produce new and better equipment, better materials and better supplies needed in the total education effort. If there is any apparent weakness in these processes, it lies in the lack of adequate communication between the producers, the educators, and the architects. Quite typically, the producer makes a product which he hopes to sell--and at a profit. He takes considerable risk in every new product. To reduce such risk as much as he can is his constant concern. What clearly is needed would be the searching out for some dynamic and imaginative educators, by industry, to help spell out and to tell industry what ideas they have on how improvements can be made on products now being used as well as new products or materials that ought to be designed and produced to better serve the educational program. Other educators should have many fruitful ideas on what types and what performances of equipment would help expand the school market. Similarly, it would make for genuine progress if industry and contractors would make greater use of the technical knowledge of our better architects and engineers for developing more practical products in the areas of construction. A mutual exchange would help everyone concerned. In fact, the SCSO was one of the first to initiate performance requirements in school design and construction. Industry spends millions of dollars in research to come up with acceptable answers to these criteria. We need more of this type of joint cooperation. We have too long structured our communications in a vertical line. Educators would talk to educators, architects to architects, and industry to their NAM. We can all benefit by greater cross-communication and by exchanging ideas to help serve our joint problems which will surely

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result in better facilities and, finally, in the best kind of education we want for our American youth. We are moving into a decade with the greatest growth potential in school and college facilities in the history of our country. Your local illustration, which was given this morning, is illustrative of the entire nation. The school and college enrollment in American--and especially the college enrollment, both junior and senior colleges--will have the greatest development in the history of our country. We will need to build more college facilities alone in the next ten years than have been built all together since the opening of Harvard in 1636. In 1965, the freshman class in the United States increased over 17 percent over the year previous and last year, it increased more than 17 percent over the previous year. There should be considerable optimism among the producers for the school market. We can afford to expand our research and our joint associations with a minimal investment in this great and productive future. No one can go it alone. Industry is vying with its usual competitors for the school market. With unusually increased spending on the part of the Federal government and the state governments and local funds for schools and colleges. We have, today, an epidemic of support for education that is the greatest that we have ever had in this country. People are more and more concerned that we get good and better education for our people and I think it's a great thing. It's the greatest thing that has ever happened in education and I think it is still growing. So today you can hardly get anybody, politician or otherwise, to say a word against school costs or education because we're pretty much for it from the top of our political structure to our local residents.

But we must work together--the three main groups. When we say architects, I would like to mention if I might be permitted, to say that our school facilities council's main purpose is cross-communication--communication between architects and engineers, the planners and designers, the educators, the officials who are the boards of education, college boards of regents and the school officials, and industry--both the producer and the distributor--because we need them both. The distributor comes out and handles much of the material which the producers put forth and it is up to the distributor, many times, to make the local contact. We need this cross-fertilization, varieties and cross-communication. We can help each other. We can't go it alone, and I think one of the things the school facilities council was organized for was to fill an unmet need for better communication between these three general groups. And we say general groups because when we say architects, we mean the whole group of designers and planners because of the term AEI--Architects, Educators and Industry--but I think you understand what we mean.

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Now, I think my time is up and I'll close.

We have a responsibility for the youth of this nation. We have a responsibility as citizens and we have a responsibility to do our share and do our part in that responsibility to give us the best kind of education we can have in this country--both from the elementary-secondary, junior-community college, and senior colleges--that we can give to our country. And I say best wishes, and thank you very much for your very quiet and listening response. You know, the fellow said one time, "I have trouble with my wife." "How's that?" "Well," he says, "she talks 25 percent faster than she can listen and I never can get the two to work together."

Thank you very much.

This speech was given at the School Facilities Planning Conference held at Wisconsin State University, Whitewater, on June 14, 1967.

THE ENVIRONMENT FOR LEARNING
Dr. James MacConnell

Thanks a lot, Wally.

(Comments about the PA system.)

(Recorder cut out and then back in again.) . . . planning the program, we had a chance this morning to discuss it, I think, fairly well and to sort of take a look at what is going on. Some of us had a chance to kick around more than others and I think one of the things that we have to realize is that things are quite a bit different than they were. I think most of us can remember when the dining room was in the middle of the house and the bathroom way out in the back yard. Today the bathroom is in the middle of the house and everybody eats out in the back yard. This is one of the innovations that we brought. I think the dining room people will never get back in the house again because the plumbing people have a better communication system as Jordon was talking about today. So, this is pretty well set. If you don't have three bathrooms in the house, next year you won't be able to sell it. We've been doing some work for the Plumbing Fixtures Manufacturers Association and they're right in there, and I think the dining room has gone down the drain and this will be that.

I think another thing that we have to realize is that practically everybody is going to school now and this is quite different. I was doing a little studying the other day and read that about two out of a hundred were graduating from high school when my grandfather was 17 years old, about 8 out of a hundred when my father was 17 years old and about 20 out of a hundred when I was 17 years old and now about 70 out of a hundred. So practically everybody is going to school. This is causing us some real problems due to the fact that everybody knows about school. They've gone to school, know somebody that went to school or they taught during the depression or something of this type. A doctor sort of has it made. He can give you a pink pill now if you have a pain and tell you to take it and you'll do it. Yet if a school teacher says do something, or a principal or a superintendent, why this is pretty bad because everybody knows what school should be like. We're something like the two cats sitting on the fence watching the tennis game. One was looking ahead and the other was watching the ball, like this. The first one said to the second one, "Do you know anything about tennis?" He said, "No. Why are you so interested?" "Well," he said, "my old man is in that racket."

I think everybody is in our racket and everybody is in the architect's racket because everybody's bought something or built something for nothing that fell down--it didn't cost anything so they were proud of it while it stood--and so everybody knows

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about architecture, everybody feels very suitable to evaluate architecture and I think we, as teachers, make a big error here. If we can put our time in programming and writing down what we're going to do, and let the architect worry about how he's going to put this together, then we're going to have a pretty good working team. I think the weakest spot in all right now is in this general area. As most teachers say in our course at Stanford, "Well, we couldn't take your course. We aren't architects." I said, "Well if you were architects, you probably should be in a school of architecture. You shouldn't be doing this thing."

What are you going to do in your school next year? What would you like to do now in these areas? Well, then you find a lot of interesting things take place. We've been doing quite a bit of work in foreign countries. I've been spending most of my time, in fact, bouncing around. We had a project just recently down in Rio and we worked directly with the Ford Foundation and most of the time when they get a fairly advanced program, they call me. If it's in Hawaii, I go; if it's in Alaska, one of the graduate students goes. I've been to Alaska. If the sun ever comes out up there, why, that wouldn't be bigger than New Jersey. That's a big block of ice. Keeps the Russians away from us 7½ minutes longer and that's why we've got it.

But you find that people have all these problems. So, I got a call just about a year ago to come to Rio. The Ford Foundation said the board had just bought the site. I don't say anything that's not kind about it but we wondered if it was a problem that they should have bought it or not and see what you can do about it. So I went down to Rio and the site was 12 acres with a 1,200 foot rise on the site. First thing I did was compliment them on the drainage. Then we started to work with the architects to find out just what they were going to do. They had a Rio architect who had done a plan--without a program. Had four acres of flat ground. He had the buildings on that and the rest of it was just going up like this. Well, it's hard to play volleyball on a grade like that--you keep losing the ball all the time. Also, it was really evident that nobody was really concerned about the program. And so we came back and sent a team down there--a principal from a school who had done a lot of work in open areas--and within the next four or five months he came out with a program. Now the building is about to be started and the front of the building is four stories, the elementary building is even, the back of the buildings go right into the grade, of course, because it's going up like this. But it's going to mean that they're going to have a four-acre area to use for recreational purposes.

I think this is what we're talking about when we're talking about a program. We spent, I guess, this last month in Melbourne,

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Sidney, Tasmania and spots like this out in Australia. As a matter of fact, just a couple of days ago--and here again the big problem--the architects come along and show you the plan, or the school people show you the plan and say, "What do you think of this? Are you for four-story buildings, three-story buildings or what? Or underground?" Well then you say, "Where's the program?" and nobody has the program. This is the thing that's worked out all the way along. Even up in Milpitas, a little community near us. Here a few years ago they talked about the bomb scares. They said, "Let's build this building underground." Well, for the whole town of Milpitas, which has about 12 elementary schools. Then they found they didn't have enough for the 12 schools so they said, "How about for one school?" They found out that was too expensive. They found out they had enough to build a sixth grade underground. Then they thought they shouldn't do that because everybody in California would be dead and they didn't want the state run by a bunch of sixth graders from Milpitas. So this went down the drain.

So I think the problem, is when you sit down, is what happens in these areas--what are you going to do and what's going to happen the next few years. And most of us just aren't looking very far ahead. It's hard to imagine what's going to happen in the next 25 years. For instance, you talk about the man on the moon. When we were kids, this was the nursery school rhymes and so forth and now we're sending one of our professors. I think he's going to the moon--I think his wife put his name in. In the pictures in the paper tonight, she was laughing more than he was so--

I think these are the problems that you run into, as to what it's going to look like and so we say, in educational programming, you don't ask a teacher what she wants. You try to get somebody in that says these are the trends for the next 10, 20, 25 or 50 years. And I think when you start on this, then you're going to start to get some place. We've been using university people, using high school people, using elementary people who are keen in a particular area. We're pretty stupid when we come in first thing. We take a nice area, we kill all the snakes and the frogs and polliwogs, cut all the trees down, put in a cement box and call it a classroom and then we get some guppies and put them in an aquarium and away we go again. We could do it cheaper. The one in Rio, we'll be running water to the science rooms. There are two falls on the site in Rio. One of them is called Foot Fall, the other one is about a 4-foot. We said, "Let's run the water right through the site, right through the buildings and people said we'll lose the kids and we said we hope they'll be from large families . . . kicked around so much. But then we started to work it out and you go to the Hilton Hotels and see all sorts of fountains there, pumped with a \$70 pump, yet when we get into the business, we have

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to turn around and put up a concrete wall first thing and have a kindergarten area that is twice as big as any other area whether we need it or not because we've always had big kindergartens and then we never think of dividing them with a stream, where you can put water through here, we'll have fish this long in the kindergarten--and why not? The guppy is all right but he sure is a hard one to get next to.

As you look into this whole business--I taught biology for years. It was a study of death and we used to pickle everything we caught--put it in a bottle--and now it's the study of life. This is a whole new deal--this is a total new program--and it takes a different container, it takes an altogether new program. We finished a school in Salinas, California, just recently. We got snakes in the science area that are 12, 13 feet long--had them in there for years and moved them to the new building recently and they say these snakes miss certain students when the graduate.

We talk about windowless schools. You're not talking about windowless schools in this area. You're talking about these courts--court areas where you can have science and really study science. Well if you're going to do this, why you've got a different type of program than when you have a snake in a bottle. I thought frogs were born in alcohol and I knew they didn't do well but I never quite figured out just why we did this. Well, they used to take all sorts of animals and put them in. We have several areas now. In California, for instance, we have a snake called the King Snake. People go around killing them and they are just great snakes and yet kids don't know about these things. I think we're going to have to familiarize them with them.

Also, Jordan this morning was talking about team teaching and I think one of the problems that we're having now is I don't think anybody is smart enough to teach the sixth grade any more. This is the problem we're having. So we're just about going to have to pool some of the thinking of the teachers and match teachers with children. We have a kid right now that--when I went to Australia about a month ago--he called me up and told me that it was fall down there, the leaves were falling, what the temperature was--he is in the eighth grade. Well, you get this character in a class and he's a menace. He knows too much about weather and so you have to give him away some place. We're doing more and more work with individual differences, trying to help kids. We talk about equal educational opportunities--there is nothing more untrue. They're born unequal, they're unequal all the way through. Those that can't read never will be able to because the teacher can't get to them. She takes 30 every 45 minutes and we run them through like sheep through one of these chutes, you know, and so I think we're going to have to spend quite a bit of time. Somebody was

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saying the other day, "Why don't schools look like they used to look?" Well, first thing, why don't you build them like you used to? Well, we can't afford to in the first place. And this fellow said, "What happened to the belfry?" Well, I said, it never was much good and what he learned from the belfry he couldn't talk about in a large crowd anyway. The schools today are different, are going to be different, will have a lot of open areas, we're going to have a lot of areas--in our program in the SCSD we have performance specifications which we didn't say "and or equal." We said we wanted a door that we could push with a 70-pound teacher that you could move in a minute. We got one we could push with a 7-pound teacher and move it in a half minute but you can't find a teacher that light. But this has been done and I think that these things are brought about by industry. So you sit down with industry and say well this is what we're going to do. These are some of the problems that we have and yet most of us in these communities will sit around and say, "Well, let somebody else do it. Let's not rush into this." When I was eight years old, my father, in northern Michigan, took me down to a school site. They were going to close all these one-room schools. I had three teachers in one year and not one has ever passed the eighth grade. Two couldn't have and one of them might have been able to make it. I don't know, but she's not too sharp. We said we're going to have better teachers, we're going to have more kids to play with and close all these one-room country schools. He took me down to the site when I was eight years old. Well, they had an election and two people voted for it--my mother and my father. And that was it. Last week my brother wrote and they got the site. You see, you don't push those people around. They want to be sure they're right. Well some day in the next couple of generations, they'll get the school up there and they'll close some of those schools around. Well, we're not going to have enough teachers to go around. We don't have enough teachers to go around now and the difference between getting a good education now and getting a poor education is a cement block wall. You get a real pro in here and his twin sister can be in the next room getting a poor education and if this happens three years in a row, you might as well take him out and shoot him. He's just about all caught up. Yet, if you have these teachers working together--but then you're going to have to plan a space together to work and it takes a different type of a facility to accommodate a different type of a program.

So, as we go into this, we find all sorts of interesting things happening. We say that the building today should be a tool for learning and a tool for teaching. And there is no doubt about this--and here, with this, comes all of the planning for the facility. We're doing a very little bit. We're wasting money and

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pouring it down the drain. People have been real kind to us about building because we just haven't sat down and said, "What are we going to do with these buildings?" In all the Australia work this last month, I found one educational specification of about 25 pages for \$500 million worth of building. Well, they just say whip this up into a building, you know. And you've gone to school to the architects and just get on with the work. So I think, one thing, the program is very important. I think we should take time for some questioning if there are some of these questions that come along. But now we're going faster as Jordan Larson said this morning. We're going farther. The other day--coming in from Australia, Friday or Saturday. I went down to get a ticket and I said, "What time does the plane leave?" Seven o'clock Friday evening. "What time does it get into San Francisco?" Seven-fifteen Friday. They said, "Do you want to take it?" I said, "No, I'd just like to go up and watch the damn thing take off." You'd be just amazed--I forgot about that day in there that you lose. But this is farther than my grandfather traveled his whole lifetime--he was a traveling salesman. So if we're going to act like this and travel like this--like the old lady said to the pilot, "Don't fly faster than sound. We want to talk."

You see, these are the things. Everybody wants to be on the bandwagon but nobody quite wants to get in the total picture. So you look at this and say, "Well, this is going to be different, these schools are going to be different, everything else is going to be different." You just look around and see what's happening--what's happening finance-wise. If anybody ever told any of you folks that you'd pay, oh, say, \$5,000 for an automobile when you were 35 years old, you would have said, "This is incredible. Nobody would ever pay \$5,000 for an automobile." Now look at what they cost. These people in 1936 could get a good Pontiac for \$900--you can still get a good 1936 Pontiac for \$900. But if you want a 1967 with the extras: engine, wheels--this is \$6,500--with a \$450 air conditioning unit that would help in here now. We can get a man to the moon but you can never get these damn things adjusted. They say this works well when there's nobody in the room.

So there are all these details that we haven't quite gotten to yet. I think the people are looking at schools and they expect everybody to be lined up in a row and there are certain groups like this--it's fun with a large group. And here's everybody lined up and people like to see people all set up like this like the kids in the Navy. I spent about seven years in the Pacific in the Navy. They talk about this Norwegian ship they had out there and this kid got his finger hurt so he went over to

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the doctor--had it cut. Went to the skipper and said, "Cut my finger." The skipper said, "You better get over to the dispensary." "Well," he said, "it isn't bad." He said, "Get over to the dispensary. It's right over there." He said, "The dispensary for cuts and wounds or cuts and bruises or for bodily injury?" This was a cut so he went through here. It said, "Cut to the body or members of the body?" This was his finger so he went in here. Then it said, "Minor or major?" This was minor so he went in here and found himself right outside. When he got back the skipper said, "Did they help you?" He said, "No, but I didn't mind because they're so well organized."

So, I think if we look at these schools, we expect people to be well organized and yet you look at the kindergarten and you wonder how can those kids learn anything--and the first grade and all the way through the grades, and everybody all mixed up. And yet when you stop to think that we all learn individually and we don't learn as a group--we learn individually--and yet there are certain things you can do in large groups like this. And English 10--you probably could teach all of English 10 in a group like this at a certain time because kids don't know enough about English 10 to ask questions about English 10. You could free three teachers for some time. You could really give them--I saw a class of at least 2,100 on closed television in biology and the teacher taught one hour one day a week. Well, he could sell bedbugs. He was a good teacher and he had gone down to the Gulf and he had a Portuguese man-of-war. We had one when I taught biology--in a bottle--but his was alive and he had 2,100 kids betting against him. And there is no discipline problem. I was betting against him, too. I got right in the spirit of the thing. And then they broke those people down into small groups. Who else could do a better job of teaching than somebody like this? And people say, "Oh, I don't want my child in a small group." I saw a small group the other day in Nevada. There were seven in the advanced geometry class--only the instructor hadn't had any geometry. They were all helping him--and he needed more help than they could provide. So we sit down and if you had a real Einstein, you could have five times as many people with a chalkboard up here and do a good job teaching a certain phase of math or anything else. So I think we're going to do more of this. You're going to have to do this to accommodate some of these people and you're going to have to divide these areas up. You probably can't afford a room like this that's only 5 percent efficient. You're going to have to do something like they did in Boulder City--and we have 90-some centers like this being divided up right now where you could have maybe this group across here and a setup like this with walls and people say, "Gosh, you can hear through them." Well, you can. We got all sorts of interesting things are done today--just the last few years. And people said they could remember a wall you

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could hear through and the people expect much more of a portable wall than they do of one of these. You know they put a wall like this and put a door on it and with a crack under the door this big and they don't pay any attention. But put in a wall here that moves and they'll put their ear up and say, "I think I can hear them." And yet you can get a sound under the door and so we know right now that these things are licked. Even if you pay \$10, \$15 a square foot for some of these--or \$7, or whatever it is--you're still farther ahead because you get the efficiency in your building--and we've stepped some of these up to 80 per cent efficient that were only 8 percent by opening up areas. So we see many, many blocked areas coming, which you can open up and do all sorts of things like this with them. This takes some real planning. It means sit down and say exactly what you're going to do in these areas and then go and follow through on a program of this type. Notice the colleges and universities following through and saying, "What can we do?"

Then everybody says, "Well, we want the proof. Are kids learning better?" People are--even teachers--I've been to places in cities and somebody, some clown, comes up and says, "Schools aren't as good as they used to be." And even teachers say, "Well that's right." Why, that's a lie! The schools are so much better than they used to be, it isn't even funny. Kids are learning more on television at home than we learned in school. Watching the Expo 67--I saw that in Australia the other night--all over the world with these satellite deals. The Russians sort of let us down is what happened. See, they started out with the first missile-type of deal and then science saw that every sixth grade teacher was fired the next year in this country because the kids weren't up on their science, you know. And then we started getting on the ball on science. Next year if they'd have put a piano player and an artist in a missile and sent them up, we would have been set. We would have had money for the arts and music--but they let us down right there and quit and this was a dirty trick on their part. But had they come through with even a piano player, we'd have been all right. So we never wanted to be like them and didn't even want to look at them but when they put a unit up in the air then this gets us all excited here.

So now we're talking about all these new things that we're going to do and we're talking about how to accommodate them in a building and this just means-- I think, as teachers, we are pretty poor salesmen--next to architects. Architects are the poorest salesmen that ever lived. If I were an architect, I could really sell that stuff. I think they have the greatest chance in the world but they're pretty poor salesmen. If they'd just take the stuff they throw away and put it on the table and show it to

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the school board, you know, they'd make some real sales. But they come along with one sheet of paper and people say, "Pay five and a half or six and a half for THAT??" I went to the automobile show--the 67 show--just here a while back in New York and I was just amazed. They had a robin's egg blue concrete mixer--I don't know if they're out here yet or not but watch out, they're coming this way. There was a sign on this one, I think it was \$12,500. Now who in the world would pay \$12,500 for a concrete mixer? Then a girl came up, pressed a button, opened the hood and a salesman came out. Within an hour, I never wanted anything so badly in my life. And I just thought . . . I got a chain saw in the same deal. We're paying \$40 a cord for wood and the neighbor's got the damn saw. I thought, why can't we, as teachers and as architects, really sit down and sell this program, because here's a program that's a good one for the education deal. We got the world by the tail on this one as everybody wants to be well educated. People are starting now to wonder about getting the kids into college. About three days after they're born, they come up to Stanford to find out how to get ready, how to get them in, because, boy, people aren't going to get into college.

Then we've come along with our community colleges and this is a whole new breed of cats. We're planning on a hundred new ones in California now. Foothill, which is right beside Stanford, is as large as Stanford is now. They have three campi--just like the fellow out in Hawaii that wrote his friend and said, "Please send me two mongooses." Then he said, "Please send me two mongeesees." Then he wrote and said, "Please send me a mongoose and another one just like it." Foothill has a campus and two more just like it and they'll be running 20,000 students. We have only 12,500 at Stanford. Next year about 80 percent of all the freshmen will go to community colleges. Well, this is a whole new deal that we're coming into and this is going to be a necessity because of the fact that the universities are going into the graduate program. So if you look at this, you will start to see--Jordan says it will . . . as many classrooms in the next ten years as we've built since they established Harvard in 1636. And then look at all the old stuff that's going to have to be shifted around and people aren't where they used to be and not where they're supposed to be. This is the problem right now. I was in Missoula, Montana, the other day. If you haven't been there, don't bother. You aren't missing a thing. It was a Rotary Club--the dumbest group in the world, of course. There isn't anybody here old enough to join, I don't think. One of the men got up and said, "Well, Professor, why are there this many people in Missoula?" They are only supposed to have 10,000 and they have 40,000 people there. I told him those are the people from North and South Dakota that ran out of gas trying to get to California. Well, nobody laughed in the whole place. Yet I think we're moving. The thing is, it's hard to get the guidelines to see what to do.

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We went to the San Francisco airport and a lot of these people, some of these people at least, had been there and this was about ten years ago. Our question was the junior college we were planning just off the end of the airport. I was quite suspicious of the location. My question was, "How long before jets will come off of this field?" Because this was right in front of the runway. It didn't matter so much for the propeller jobs, but it did for the jets. They told me up in the tower, with the Civil Aeronautics people sitting there, that I'd never live long enough to see jets come off of that airport. Now they're landing one, or taking off, every 2½ minutes. I had a friend, in fact, his father left him a propeller plant in Chicago and about twice a month he would fly back and forth on a DC-6 and he had it made. About five years ago he went out on a plane that didn't have a propeller and now he doesn't have a plant! This is how fast things change. Boy, first thing you're in and then you're out and we still have a lot of people wondering whether to sell buggy whips at half price or not. This is the question, and we're pretty slow and we're pretty stupid about a lot of these things and we're just afraid--and I think we probably need a little more backbone--architects and educators--and say to the people, "This is different now--it's altogether different than when you went to school." Most of us couldn't get into all the universities today . . . just a good job. We're through, you know. I couldn't get into Stanford. It's harder to get in as a student than as a professor. But, you see, the tests--some of these exams--this one, last night, in the magazine I picked up to read said, "Could you get into college?" and after the first page, I quit. Boy, they could never get into one of the places. Like the fellow in the prison said, "Boy, look at this institution. Has a big, high wall out here, and then the moat, then another high wall and electric fence on the top of that, glass on the top of the wall and then some bars--but I got in!" I think some of us can get in all right but it's lucky we are in there now but you get rid of these boys and girls that are going out the next few years, then the job is going to be: How are you going to train them, how are you going to educate them to cover this wide span? This is a real job. I think many of our communities . . . something like-- You probably heard the story about the Catholic priest, went to a small community and took care of all of this group. Several Protestants in there and he liked those and took care of them. One day he went in and here was a man all bound up--had his arms all bound up and his legs all bound up. So the priest said, "You're in bad shape," and he went like that. And he said, "Can you hear me?" He said, "Yes." "Can you talk?" "No." "Can you write?" "Yes." "Would you like to write me something?" "Yes." He handed him a pad of paper and he started to write. Just before he got through, he threw his hands back and passed on. The priest ran to the nurse, the nurse to the

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doctor and, boy, she said, "He's dead." And "I can't figure it out because he was doing so well." So he called the widow and went to the funeral. After the funeral, he said to her, "I was the last one who had communication with him. I wonder what he wrote." And it said, "You are standing on my air hose."

I think in a lot of communities today, we're standing on each others air hose because more people can find out what not to do. It's just amazing what you can't do. But if you sit down to try to figure out what you can do, there's all sorts of ways of taking care of us. And so now, as you sit down to talk about a new educational program, taking care of all these needs, then you've got some real deal. I think, when you sit in these communities and begin to realize, the people say, "I have to know for sure. Is my child getting a good education?" Well, remember the McCarthy days. You folks remember that pretty well out here--when everybody was a communist that went to a university. I couldn't get in the Pentagon for three and a half years because I was at Stanford. You were always communist about that time because . . . They tell about the skunk running up to the rabbit and saying, "Let's get the heck out of the forest. McCarthy's coming. He's going to kill all the kangaroos." The rabbit said to the skunk, "What do you care? You're a skunk." He said, "Yah, but I can't prove it."

I think this is something that you get into and then you sit down and say, "What is happening to these boys and girls?" We're doing some work in Salt Lake City and showing, in some of these newer methods of teaching, that the kids in the lower area are actually coming up very rapidly. And the high point of the curve isn't as high as it used to be because many of the people in the high part are down here in the early part where individual instruction is being given to students and they're sitting down and trying to help these people with their problems. And you're going to have all sorts of electrical devices--Ampex is coming out with stuff that'll just kill you--in about a month. And stuff that cost \$20,000 is coming out for \$5,000. Yet we're building the facility NOT to accommodate these things.

And so a person's gotta get ready. There was talk this morning about the carpet on the floor--down at Clark County, Nevada. Now you would think that Clark County, Nevada, would be the best place--educationally. That's Las Vegas. If you go from the university, it's Clark County. If you go on your own, it's Las Vegas--but it's the same thing. We got the district to put some carpeting area in the superintendent's office. They wouldn't buy it. So we bought it and put it in about four years ago. Last year they bought eleven acres of carpeting. They buy it by the

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acre down there . . . you know! Well, boy, this is the reason that this Harold Gores talks about the market going up so high, because people are using these soft floor coverings. What we do, we do another stupid thing. We come along and a lot of schools have put a hard floor where you walk on and then we put acoustical treatment on the ceiling to catch the noise when it gets up there, you know--and it never did work up there in the first place--so we go through there now and we're seeing that some of these areas you can leave them fairly open because here are areas where people are going to work and people are going to move. Take the bells out and they say, "Well, what happens?" The kids--they just look at their watches--like people, you know--and you say it is time to go and they go. Where are they supposed to go? Now your flexible scheduling that we have worked out at Stanford for a number of years fixes it up so you can have 15 minutes, 45 minutes, an hour and a half. No place in the world can you sit down in any time of your life and get interested in something and they make you move someplace else as they do in high school. It is the stupidest arrangement of any--and with 30 people. At night when you listen to the president, you either hate him or like him alone. You don't need to call in 29 neighbors to turn on the television. This is done on an individual basis and we are going to be learning more and more on an individual basis. The research that is being done in the universities--they're going to have to take a pretty close look at it because the labs are out in the field where you people are. That's where the labs are, that's where the studying should be done. Talk about these colleges and universities where they've been on sabbatical, they've been doing research. What kind of research? And he said, "Look." And he reached in his pocket and took out an envelope and took out a flea, put it on his arm and said, "Jump." The flea jumps and he jumps up and puts it back. The friend said, "Don't see the application to research." Now watch. And he pulled two wings off and said, "Jump." Same thing. Friend said, "I can't see the implication." Now watch. He pulled two back legs off and said, "Jump." Didn't move. "Jump, jump." "See," he said, "pull his legs off and he can't hear."

Well, I think that we've been doing a lot of this type of thing . . . that we're probably going to have to do a better job and I think that our whole university program . . . that a lot of the research . . . and we're going worse. We're doing more and more to studying about less and less, you know. The thing we're going to have to do is to go out in the areas where you folks are. We already know so much we haven't done anything about. We know how to better light a building, we know how to better build a building, we know how to better air condition a building--if you can make it work--and if you could get . . . you know. And these things are all with us. We can get ready for a man on the moon but it's hard to get a man across the street. Somebody said to

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me, "How do those people get across Bay Shore?" (the busiest area we have in California). Now, they were born over there!

As you get into these programs and start to study them, there are just all sorts of interesting things that you can do. So the big thing that we have to talk about today is how you accomplish this. I think it's going to take more of the national dollar than we've had up to now--because, again, we've been pretty stupid. We don't go in and really pound the table and ask for it. I was at a meeting the other night and a farmer said to me, "There's a hell of a lot of learning left in that building. If you can get that out of that building (that was built in 1900) I'll vote for your program." I said, "This isn't my program." He said, "It's your program." I said, "What about chemistry?" He said, "Enough chemicals over there in the corner to blow this whole town up." They had a sack of lime and some sulphuric acid. This kid isn't a high school graduate--he's an alleged high school graduate. Wait till he competes with some of the people who've had good instruction and the facilities to operate in. And this is right with us and we have just hundreds and hundreds of these little schools. I was in a little school, trying to close it, with a group half this big and there was only one person in the crowd who wanted to close it and that was myself. Nobody else wanted to. They just said, "These little kids can't ride in a bus." (High school kids can.) And I tried to sell them on the idea that they had more invested in the high school kids so if something happened to the little kids it wouldn't be as bad. Well, this didn't go over very well.

But as you sit down and watch these programs going along and see how you can accommodate them and whether or not . . . I was sitting in the schools for years--one school--and left because they wanted to close it and join up with the town. If you didn't hate everybody in the next town, you couldn't live in the town I was in--and now they're getting ready to close. It takes about 25 to 50 years. Industry can change overnight but in education, we just really crawl along and say, "Well, now, let's make awfully sure--one, two, three--and then we'll go to some other new idea." And so I think the SCSD building program we talked about today--here's a book you ought to get a hold of. It's "SCSD--the Project and the Schools, Report of Educational Facilities Laboratories." Laboratories is what it is in Australia and it's laboratories in Canada and it's laboratories here but it's the same thing. This booklet is a good example of what a group of people can sit down and do--work out a program--and this is on a performance specification where we want to do a certain thing. This is the new report just out: "The Project and the Schools," it's called. You can get through Stanford or you can get it through New York, 477 Madison Avenue in New York. This was kicked around by architects and they

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said their eyes turned red, and their hair fell out, and they dropped to the floor and screamed and kicked and hollered and said, "They're trying to run us out of business." I think this is the first real opportunity that architects had a chance to really do some real thinking on their own and not have to fuss about a lot of stuff we ask them to fuss about when they should be devoting stuff to design. This is one way--another way--to plan a facility after a good specification was written for it. So as you check into this, you'll see a lot of interesting things that can be done. I think that the statistics are . . . you can . . . people use them. I was up in Minnesota the other day on a program and the ministerial association representative was on ahead of me and he was talking against drinking and he said that 30 percent of the fatal automobile accidents were caused by drunken drivers and I followed him on the program and told him that he had just proven that 70 percent were caused by sober people. See, you can use these figures any way you want to. But the thing is that what you're trying to prove is that there are a lot of interesting things to be done and there are a lot of people around to do them. So I think when you ask for the finance, this is another big program because people just say . . . and we're so conscious of it and we just ought to quit fussing around about it--it's how much a square foot, you know. And the most stupid way to ever figure on a building is how much a square foot. I was with an architect about four years ago, in a meeting, and the school board said--the only time I worry about Federal control is when I go to a school board meeting and see what they do about local control--and this was a little community and they said, "We want a cheap building." He said, "Do you really want a cheap building?" They said, "We want a cheap building." He said, "Okay." So he planned and designed a cheap building for them. I was there for the dedication. Everybody had a doorknob in his hand. And then they fired him because they wanted a good building for nothing. But four of the board members all had new Cadillacs. And they traded off the year before to get a new one because it was more economical, they said. Well, this is for the birds, you know. So I think what we're going to have to do is sit down and say . . . we may have to be more subtle about it . . . something like the Norwegian ship, again, they had out in the Pacific where the kid--the bosun's mate--and you people in the Navy know is really a good deal for a kid. So he was the bosun's mate and the skipper called him and said, "Announce to the crew that Hanson's mother has passed away." So he went off to the intercom system and said, "Now hear this, now hear this. Hanson, your old lady just kicked the bucket." Well, this just killed the whole crew and the skipper and he called him and said, "If that ever happens again, you're all through being a bosun's mate. It will happen and when it does, I'm going to give you the responsibility and I'm going to listen in." Well, Peterson's mother passed away in about a month so he called him in

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and said, "Now's your chance." So the kid went up to the bunk and stayed there about an hour, came back and got on the intercom system and he said, "Now hear this, now hear this. All youse guys on this ship, come up to the topside." "Now let's have all you guys line up in a straight line. All you guys with mothers alive, take one step forward. Oops, not so fast there, Peterson."

So I think that it depends quite a bit on how you go at it but I think you're going to have to . . . I think in the midwest particularly, it's more difficult. People scream about taxes and you don't know what taxes are--hardly. I have a house, I'm paying \$110 a month taxes. Well, we used to pay \$35 tax and worked it out on the road--half of it. If people did work it off, why there was a sudden drop where they didn't put gravel and we did, but this doesn't go for the speedy highways today and they take away from us now and the state is doing what they think is a better job. I think the time is coming when we're just going to have to take a hold of this thing and say, "Okay. It's going to take so much to do this and are we going to do it or are we not?" And I think teachers, I think we'll be paying \$18,000 a year for teachers sure as the world--for some teachers. They're going to be real pros and if we're not going to do this we're not going to have them--they're not going to be in this business. You go to these foreign countries, and go to Russia, and the guy on top there is a professor and a writer. Here the teacher is garden variety, somebody that can help out babysit until the parents can get back home. Well, this is a different deal. I think that you should have a much greater respect . . . and yet people here say--well, a lot of people--don't send everybody to school--just the smart kids, just my kids. Leave the stupid neighbors' kids at home. Well, this isn't going to work either because there is no work, there is no room at the bottom any more. San Francisco airport--they had, about a month ago, I think about 12 people taking tickets when you went in with your car for parking. When I went in there yesterday afternoon, they got a new machine there and it's about this size and it says--there's a hand that goes up in front and stops you and you pull this ticket out and it buzzes and the arm goes up and they lay 12 people off. Well, those fellows are running around looking for . . . there's not a place for them and so you gotta get these people filled in. Same thing with the Australia deal. Between high school and the university, there is a huge area to be filled in and we're doing this with the community college and we're doing it with technical schools and we're doing it with all sorts of things and yet we aren't doing very much in planning for these particular facilities. So now we're saying, "Well, how you going to do it--what are you going to do in these areas? Are you going to have large groups like this, are you going to have some smaller groups, going to have some individual

work--the carrel in the library, are you going to be able to dial books up, are you going to be able to have the scopes to read, are you going to be able to save this whole area and not have to destroy the old books but store them on the scope type of thing? There are just a million decisions to be made and we sit around and say, "Well, things are just about like they used to be." And this is not true. They never were in the first place and now they aren't going to be. So I think as you check this over, you're going to see more and more inflation, we got it coming. Seattle's been going up about 7 percent per month inflation due to Boeing's new job. One outfit called the other day and they had 1,500 new trailer courts in one township--and with no tax on any of them. Well, there's all sorts of tax problems, all sorts of problems along all these lines. So if you look into this thing and start to check around and bang around from spot to spot--and we're doing some work in Europe at the present time. Most of our work is primarily in the Pacific because this seems to be the place where we are closer to and transportation is cheaper that way and so forth. But when you get right down to it, the Hawaiian Islands, Alaska--the biggest problem they have in Alaska is air conditioning. They talk about selling refrigerators to Eskimos--the biggest problem they got up there is cooling for the electronic units up there and these buildings are running \$45 to \$70 a square foot and yet people say, right away, how much can this architect build for. Well, \$13.02. How about saying it costs \$13.50. Well let's get him, he's cheaper. I came out in the plane yesterday that cost \$3,600 a square foot and nobody was running around trying to cut it down very much. I wasn't, especially, because I kind of felt safer, you know, and perhaps I kind of thought the pilot wasn't reading a book on how to land and stuff like this. These people are well trained and there are thousands of them coming along. I think Pan Am is adding 1,300 new pilots now. All of this type of new thing coming and yet these kids in the rural areas, in the small towns, there's no work there. I was in Kalkaska, Michigan, a while back on a program. Thirty-six graduates in Kalkaska from the high school and 34 were leaving the next week for Chicago, Grand Rapids, and the two that were staying didn't look too sharp so there's not much leadership left in Kalkaska, you know. So if you go in to be in a program like this . . . and then you're going to have the state aid program, the Federal program, 'cause it's going to cost about \$21,000 to get this kid to be 18 years old. Then you send out 34 times \$21,000 out of Kalkaska in one weekend--and you could buy Kalkaska for half that, you know. Well, then these people are going into the centers to produce so you come up with state aids, come up with Federal aids. People scream and holler, you'd think the Federal government wasn't part of us but this sort of association is there in some way, you know. I think we'll have more and more Federal aid. We've hollered about it for years and didn't know how to use it when we have a chance to get it--but these are the problems

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that we're going to have. Our buildings are going to have to be-- Industry is building primarily, now, about 25 percent in the building and 75 percent in the tools. We're running about 75 percent in the building and about 25 percent in the tools and a lot of schools have no money for tools at all because, as Jordan said this morning, we don't take time enough out to plan for the facility. I was in Hawaii a while back and made a statement that they were wasting money in Hawaii--they had too many maximum security buildings. Well, this didn't go well at all and they have a lot of Minnesota architects in Hawaii that are building for frost conditions and a lot of interesting things--and it hasn't frozen there for a hundred years, you know. Quick as they get the money, they give their architect six weeks to get the plans out to bid for a \$4 million building. This is "rush-ism," you know. So I made this statement. It was in quite a large group and they're politically oriented in Hawaii--right from the superintendent of public instruction on down. If the democrats are in, why, if he's a democrat, he's in; if he isn't, he's out. So, I got back to Stanford and they called the president, I guess, or somebody, and he called the dean, the dean called me and said I'd got the whole island upset and I had to go back. Well, this is fun--going back to Hawaii--anyway, so I went back and they had this big committee meeting. They said, "What did you say?" and I told them. I said, "There are too many maximum security buildings and they're planning the buildings too fast. It's a wonder you have doors in some of the classrooms." Well, everybody kind of laughed, you know. Next morning the Honolulu paper said the man from Stanford says there are too many classrooms without doors and I got in trouble again.

But these things are happening all over. We aren't taking time, we don't have a program to give the architect, we don't have a program to think out in the community, we aren't utilizing these things well enough so this, I think, is our big problem. I think we're going to have all sorts of open areas, we're going to have all sorts of small areas, we're going to have . . . if the Egyptians that built the pyramids came over here tomorrow, the only time that'd be lost is coming and going to work. We're doing a lot of that same stupid stuff that they did, you know, and taking the time to put it up when we can put buildings up much better than this, much faster and we're going to have to do it because there isn't going to be the time to do it. And we're going to find, also, that much of the material coming in . . . Chicago teachers a while back and we took an exam in a group like this and they have Edix equipment right on the desk. Had the A, B, C, D, E. They put an exam on the board and you pressed A for--matched them up here. You got through and they hand you a card, gave you your score, told you how you compared with the rest of them and where you made your mistakes. This is coming, this is a case of just around the corner and no teacher, any more, is going to carry stuff like this home every night when

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she can work in the airlines and go all over the world and even smile when she gives you your breakfast . . . and catching these 125 men at a time all tied down. This is a better deal than a schoolteacher is going to get.

So I think many of us could do more . . . something like the two crows sitting on the fence watching a jet take off. One of them said to the other, "Wish I could fly that fast." The other one said, "If I had four tail feathers all on fire, I think I could." I think we could do much more if we sit down and try to see what we want to do, what we'd like to do, in our whole program, where we should be, educationally--find out where these kids are. We're going to be matching students with--we're going to know much more about the students. We'll be picking them off the satellite deals. We'll be getting this stuff down. We're going to put much more in counseling and in guidance. We're going to know much more about occupations--there isn't going to be a day when the banker comes and tells you what the interest rate is, you know, and this bunch of dope we're getting today. He's going to be able to sit down and say whether he wants to be a banker or not. And even banks are changing. They're even giving people money that need money. Tell about the fellow that went to the bank to get some money. The banker said, "I have a glass eye and I have a normal eye. If you tell me which one is the glass eye, I'll give you the money." And the fellow said, "Your right eye." And he said, "You're the first one who guessed it. How did you know?" He said, "Well, I saw a little gleam of sympathy in that one." So I think that we're going to see a lot of this. We're going to see industry--industry is asking questions now--have been for years--answering questions that we've never asked. They can produce a lot of material. If we'd sit down with them and say this is what we want like we did with the SCSD, these are the areas we're going to concentrate in--you watch Ampex, you watch the Littons, you watch the big electronics people move in, and then the building becomes a tool. It becomes a part of the learning process. And a desk will be a tool. It'll be hooked up electronically. The library will be a tool and we'll be going around . . . when we went to school, teachers spent most of the time trying to find out what to get out of us. The kids today are spending all of their time trying to find out what they can get out of the teacher. They shifted the thing when we didn't even know about it and so now you go into Brigham Young University and watch some of the instruction going on there and the kid--he is on a contract deal, and he sits down and when he needs help, he goes to the teacher and finds out where to get it. And we're still around preaching to the kids and half of them don't need it. We find that we're getting at Palo Alto now a good share of the kids in high school are in college. We've been treating seniors like freshmen and the librarians, you know, won't trust

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anybody any place. I think a post this big is a detriment in any library because you can't tell what would happen behind it. They're saying--the good librarian, you know I got all the books back but one and I think I know who has that one. Well, that's out now. The librarian's becoming a real specialist in the whole area of instruction and of communications and this is a whole new field and they're training them in this setup now and I think we're going to see some great strides coming along in that general area. When I die, my wife is sort of looking forward to it because I haven't been home for a few months. She says she's going to go out and whisper in my ear when I'm in the casket and say, "There's a school group that wants you to talk to them." Then she's going to wait and if I don't jump up and head for the door she's going to say, "Bury him. He's as dead as hell." They tell me when I die they're going to put on my tombstone--I'll be buried up in northern Michigan where things don't happen very much--I'm going to put, "Although I'm dead, I want you folks to shed no tears for I'm no deader now than you've been for years." This will burn them up. I can hardly wait. Then I'm going to put below on the tombstone, "Don't stand there. Do something." There's so much to get done and such a short time to do it. And I think that we're going to be taking more and more information from younger people--which is difficult--and from different people. We used to have this minister up home and he was talking about God creating man in his own image and molding him out of clay and leaning him against a fence. He said he created woman in his own image and molded her out of clay and leaned her against a fence. About that time a little old lady in the audience said, "Pardon me, Pastor. Who built the fence." He said, "It's damn fool questions like that that makes me want to quit the ministry." I think there are a lot of questions that make us want to quit the teaching business--a lot of questions make us want to knock the architects 'cause everybody's looking for a simple solution in the other fellow's field and this is very difficult for most of us to face. However, I think the time is here when we're going to be moving and moving very, very rapidly on all fronts and getting a lot more knowledge in a short time. Did you see in Michigan State where the kid is ready to graduate from there only 12 years old. How would you like to have him in your class with a group of 30?? This is the stuff that we're finding out now is happening all over. So the people that we treat like freshmen when they're seniors and give them six weeks to grow up and send them out to the university where nobody cares what happens to them. We'll have seniors in school when they're five--and why not? Why have the seniors sit around and wait till he gets old enough to get out? And we'll be using them as aids in our regular school system. There is no reason why we can't. There's all sorts of things--a few laws--and those are just put in to be taken apart anyway--and there's no problem whatsoever in most of the states

along this line. So, as I look at the thing, we see all sorts of changes coming. I don't think the organization, as Jordan said this morning . . . the organization means little whatsoever. It's the idea, what you're going to do with these people and how fast can we put them through and how can we take the facilities, the plant. I think the site is fast becoming a tool of learning and a tool of teaching. All we do is take a site and level it down, pave it . . . and we could do a lot more with these if we would give the architect some time and say to him, "Here are the problems. Here are some of the things we want to do." And then start from there and I think that we would all be much better off. And so I would say in going through this that we'll have a bigger job to do in the future. We're going to have high schools doing right now what colleges were doing just a few years ago. They're coming right down the line on this one. Also the university doing stuff that we never even dreamed about doing. We just finished a \$110 million atom smasher at Stanford underground--it goes right by my house and makes you feel secure, you know. . . a tube this big around, two miles long--and we engineered that thing so it was just perfect all the way through. They shoot those atoms there for two miles and, boy, this sort of stuff. And then people sit around and say, well, things aren't changing. Tell about the submarine during the war. Remember, I used to be out there in the Pacific and when daytime come you would go down and charge the battery--or you went down and waited--nights you came up and charged the batteries and the next day, down you went again. You missed one day and you didn't come up, you know. So you got interested in the battery charging deal. Here about five years ago they went all around the world in one of these atomic submarines and only came up once--all the way around! Come up every three years so the boys can re-enlist. So with this going on-- And then people come up and say things are about like they were. Well they aren't, you see. And the thing that we have to do in all of these changes is to make it clear to people that they just aren't going to be this way again and that we have a much better job than we ever had before.

So I'll say to you now as I say to my wife when she goes to the beauty parlor, "Good luck." If there's any time for questions, we'll go into them and . . . I don't know. There're two or three clocks around here and this one . . . mine says 7 after 11 and this one says it's 20 minutes to 12 and I know in Australia it's yesterday at 2:10 in the morning. So, aside from that, I'm just about wound up here in this quick overview and I'll turn it over to the chairman and we can do what you want to at this time.

This speech was given at the School Facilities Planning Conference held at Wisconsin State University, Whitewater, on June 14, 1967.

BLACKBOARD BY WIRE DEMONSTRATION
Mr. Robert W. Louth

Good morning!

I find it very difficult to follow Dr. MacConnell but if you will bear with me I will try to be mercifully brief.

The little story I would like to start with is one about a chicken and a pig who were walking down the street and they see a sign in the window that says, "Bacon and eggs, \$1.25" and the chicken says, "Doesn't it do your heart good to see that advertising for our products?" And the pig says, "It might do your heart good but, you see, for you, it's only a contribution. For me it's total commitment."

The group that you people represent: the architects, the educators, the planners--also, as Walt tells me, some of you people from an educational business meeting and also from an audiovisual meeting that is taking place simultaneously--are all totally committed. We, in industry, are kind of recent joiners to this amalgam called American education and we are quite convinced and this is our reason for joining . . . that it is the business of the sixties and the business, certainly, of the seventies.

To get to the real core of the subject this morning, perhaps a comment made by Professor Perkins--Dr. Perkins, president of Cornell University--best summarizes the statement of the problem that he is working with. He made a comment about a year and a half ago that he could have more faculty meetings at the airport than at any other single location. And maybe Dr. MacConnell's schedule attests to that sort of level of demand upon his time and, naturally, travel. This highlights a point that professors or instructors are called to act as consultants to industry, to government, to the military and, of course, to educational conferences away from campus. In all those events, though their work is vital and needed in these other areas, their work at the university sometimes suffers. A president of a university or a dean is certainly acutely aware of that.

Now there are alternatives to this problem or alternative types of solutions. You can continue to allow it to go on is the first way to cope with the problem and that is, of course, to do nothing with it. The second is that you can do as we do at the elementary and the high school level: You can transport children to the seats of learning, whether they be elementary or high schools or colleges. The third alternative, of course, is to mail literature to students who are interested in coming in contact with great minds or with experts in given fields. If this were a totally satisfactory solution, then libraries, by themselves, would have been, let's say, valid substitutes for teachers a long time

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ago and, as we know, they haven't been that--not, at least, for beginning learning. The other alternative is to bring in these experts via closed circuit television or by educational television. And even though we are in the television business, we must honestly confess that we don't think television has reached the millennium yet--not by a long shot.

So we come to the . . . let's say a resource that we have available to us in this country, that Sylvania considered and tried to implement, and this resource was our telephone system. This is something that kind of nets the entire country together and would allow an expert, an instructor, to be put in contact with students wherever there are telephone lines. Hence, we came up with this ECS-100, or the blackboard by wire, which allows an instructor to enter into a two-way dialog with students in a number of different remote locations. And, of course, it also allows him to transmit his handwriting similar to what an instructor has been doing for years when he uses a blackboard. The one thing that I would like to dispel right at the outset is that though he is transmitting his handwriting, you cannot see him and we do not pretend for a moment that this kind of relationship with the instructor is a total substitute for a face-to-face confrontation but our position is, a contact with an expert is better than no contact at all. The economics of the situation also aided us to use the telephone lines for the transmission. For those of you who are not technically oriented, a quick comparison might be in order. If you wanted to transmit a program from New York to Los Angeles, which is something like 2,400 land miles, for one hour on closed circuit television, the transmission cost alone would be about \$3,700. If you wanted to do this same thing using the blackboard by wire system for two lines, one for audio and the other for graphic, for one hour, the cost would be \$70. So there is a factor of about 50 to 1--it would all depend, of course, on the distance that you're transmitting--but that ratio is maintained whenever you use closed circuit television. Now, as I say, I'm knocking a product in our own line when I talk about that and I'm knocking microwave or satellite transmission or coaxial cable. I'm knocking it only from the point of view of price. Until the price for that comes down for schools or for educational use, we have got to consider an alternative means.

One other point I would like to make before I go into the actual demonstration is for the display device to present this information to an audience or to students, we have chosen the television monitor or receiver. You may wonder about that because I know many people are enamored with the large screen presentation that the overhead projector uses, the moving picture projector has used for years and I will say that though those certainly are

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attractive ways to present information to a large audience, or even to a small audience, the difficulty of using a device for only one purpose--to make an overhead projector and to use the screen--the projector being the possible problem here--that has only one purpose perhaps would delimit its use in the educational setting. We feel the monitor or TV receiver is kind of a universal receiver for pipeline, for information. Whether you want to bring in film, 35 millimeter slides, videotape recordings or live programs, you can use this monitor for all those purposes and we say, in addition to that, you can use it for the handwriting of an instructor many miles away while he makes a presentation so we are using this kind of economical, flexible receiving device.

At this time I would rather not take up any more time describing it. I will say that we are only going to draw the curtains apart partially in order to simulate the remoteness of the instructor from this audience. I would also like to say that I don't know whether the one monitor that we have on the stage is going to be adequate for all of you but I will try to limit myself to drawings or information that you will be able to see from what I hope is the back row.

The one other point I'd like to make . . . If you wanted large screen presentation with a video signal or with a television signal, that is possible today. There are television projectors, as I'm sure many of you know, and this would allow us to be projecting the handwriting on a large screen. So that's not impossible with a video signal. What I think I would recommend had I the resources here and the people able to back me up for this presentation is, perhaps, it would be advisable to have three or four monitors made available for those of you in the back to see.

But so much for apologies and let me just say that it's set up with kind of minimal effort. We're happy to get this portion of the program at Mr. Zastrow's invitation and I hope we use it effectively for you.

At this time I will go backstage and make a brief presentation and following that, I would like to come out and encourage any questions that you might have as a result of seeing the presentation.

(Mr. Louth left the microphone to make the presentation.)

This speech was given at the School Facilities Planning Conference held at Wisconsin State University, Whitewater, on June 14, 1967.

MEETING THE CHALLENGE OF TOMORROW'S SCHOOLS TODAY
Mr. Curtis Gallenbeck

Thank you, Wally. I'm sure you know that this is an unexpected and unsought for pleasure.

Before I go into my talk, I think I should compliment you on coming back for this presentation in the first place. I think it's terrific to have a group that's as interested as you are--this heat is pretty bad. I certainly didn't expect to be participating in this. Wally and I agreed that the School Facilities Council would provide the talent and that he would do all the work. We had Dr. Trotter from the United States Office of Education lined up way back before Christmas. The only problem was that Dr. Trotter didn't know at that time when his Reserve Unit was going to be called for training. I thought we had an agreement that he was going to provide somebody from the office if he couldn't make it. None of these things turned out to be so. This is the unexpected source of my appearance today.

I really didn't want to be on this program because I heard Dr. MacConnell enough to know that he's pretty tough competition. He gets you all kind of choked up . . . get out here, kind of feel like the guy in Boston. He was home with his wife and he walked to the door to answer the knock on the door. He opened the door and here was the Boston Strangler. He gulped a couple of times, turned around and he says, "I think it's for you, dear." I couldn't find anybody . . .

The only other piece of advice that I had before I came down here . . . Al Peterson from Galloway Lutheran Church, one of my congregational members, is here today and he might appreciate this. I'd gotten involved in the Bethel series at our church and we had a little dinner the other night. Pastor Anderson got up to speak and I happened to be in between the pastor and his wife and she passed a note up to him and I'm one of these people who just can't resist opening up notes--gotta take a peak to see what's in there. It said K-I-S-S, and I thought, gee . . . I've been married 25 years and he looks like he has, too, but I thought that's pretty wonderful to have that kind of support. I'm sure Betty wouldn't be here today . . . think she's kind of nuts if she was--but I wouldn't really expect that kind of support from my wife and so I just had to say something to the pastor after the meeting. He said, "Oh, boy, you just don't know. That stood for 'Keep It Short Stupid'."

So if you'll turn on the light back there, I'm going to try to keep it short and get out of here. Too many people know me in this audience anyhow. You know you're not an expert now.

My friends, Drs. Larson and MacConnell, got out of here before I could get into this. I got a few slides here . . . they

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were talking about change and I think a few slides are worth as much as all the conversation in the world. The kind of world this guy lived in is a little different from the one that our kids are going to live in. You may remember something like this--some of us oldtimers do. It was a kind of quieter, slower moving world. Right? Things weren't moving as fast. I think we could get out of the way of most of those things. The world was insulated--you didn't really get involved in the kinds of communications that we have today--primarily because of this insulation of time and distance but also because, I suppose, of the inadequate forms of communication. It was a world, certainly, at the threshold of scientific and technological breakthroughs.

What about the schools? Well, they just tore down the old third ward school in Beaver Dam where I went to school. It's very, very familiar. It's a familiar sight to some of the fellows. I was afraid we might have so many young guys here that they wouldn't remember it but that's the kind of schools we learned in. Right? Well, that isn't so amusing any more because this kind of a shot is put in to say, "These are our kids" and the kind of world he's going to live in is one in which staggering change is going to be a fact of life. It's a world that's going to double its size in this century. The moon and other parts of the solar system are within man's domain. We've got machines that can multiply thought and logic a million fold. We're getting around to the point where we're in the process of desalinization of water--trying to tap large underground lakes in order to increase our supply of pure water. We're even going so far, I think, that we're beginning to see that we can harvest food crops from the sea in order to alleviate our ancient dependence upon the soil. This is symbolic of a tremendous advance. We've got nuclear power plants that are going to give us unlimited energy. It is certainly in our cognizance that electronics and atomic science are revolutionizing diagnostic medicine and surgery. We're going to have audio and visual communication between the continents--I think we're doing pretty well with that already--and among planets, it's going to be instantaneous. It may be a little expensive but I think even that's going to get down to a point where, in the long run, we say it's an inexpensive form of communication. And it is, certainly, going to be instantaneous. Our travel--the way the kids are going to get around this world--they're going to rocket from one end of the world to another--I suppose you might say as casually as we go to the supermarket. They'll probably run a greater risk going to supermarket than they will getting in this airplane. But travel is certainly going to be swift and effortless. Above all, I think there are going to be, and are occurring, breath-taking advances and new knowledge, with one revelation leading swiftly to dozens of others in irreversible geometric progression. So change is going to be the only constant in the world that our children are

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going to live in and the schools that they're going to learn in-- I think they're going to be just as changed as their environment. They have to be schools which meet the needs of a generation which must take its place in a world of change. They're going to take their place in a culture that they didn't create and amidst pressures that we certainly haven't been able to figure out. They've baffled and perplexed us for quite a while.

I hope that many of you have had an opportunity to get a hold of this book. It's the American Association of School Administrators new book, "Schools for Americans." In going through there, I picked out this quotation that pertains to the schools and education of the future. It says:

Lockstep, grade by grade education, is not enough for him. His will be a new type of school facility with the focal point lodged in the individual, one which must provide a functional environment for education moving into a state of unending transition. We're going to have to provide a visual environment which both reassures and inspires, environment that says to the children that change is a challenge, not a threat. It should encourage innovation and really lend itself to modification as the educational program grows and changes. It should be a community rallying point, a focal point for community learning from cradle to grave. Above all, as far as I am concerned, it should not force the educational program into a restrictive architectural mold or be unrealistic. It's not change, per se, that the schools of tomorrow must foster but rather the capacity for change.

What about the educational programs necessary to meet these challenges and changes in perspective that this new knowledge requires? Well, the American Association of School Administrators again continues that

. . . The outlines of an educational program necessary to meet these challenges are, perhaps, less discernible than projected scientific achievements. As one looks ahead, however, to emerging, unfolding instructional programs, he sees greater reliance on non-graded grouping and individually paced study, closer tailoring of educational programs to student career plans, training for occupations beginning in the elementary grades.

They see in-service programs for teachers and administrators that are going to try to keep them sensitive to the implementation of

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cultural change as well as fully acquainted with the new and emerging vast body of knowledge that exists. The rapid rate of growth for both the oldest and the youngest age groups inevitably means the increasing demands for education at opposite ends of the age spectrum. Now, I happen to be privileged to be a member of the State Commission on Aging--have been since its inception. The only really good environment for learning that I have found across this country for older people is found in the headquarters of the American Association of Retired People down on Connecticut Avenue in Washington, D. C. Years ahead of most of us, they recognize that as we grow older, get to be my age, you don't want to be threatened with tests any more. You want to acquire knowledge but don't set me down and give me a pencil and paper test. I had all of those I want over at the university many years ago. And I don't particularly like to be lined up in a row of seats. I sure don't fit into any of these elementary classroom seats down at the PTA meeting any more. My eyes aren't so good any more. I have a little trouble focusing and I could use a little bigger print and a little better light. If you're talking about meeting some of the educational requirements that I have and others like me, you're going to have to do something like they've done down at the American Association of Retired People where they're placed in a self-paced learning situation with the kind of environment that's as comfortable as my living room and where I don't have somebody standing over me ordering me to do something. I think we're going to find more of this getting into the schools into the kinds of educational programs that you're offering in these schools. Maybe I won't see it, but it's coming.

I think, also, we could say that getting a job and earning a living--above all, making a useful contribution to society--are uppermost in the minds of most people, especially the young--in my book. They are recognizing that education now more than ever before stands between them and the jobs they want. I think they're turning to the schools to provide the skills, the information and, again most importantly, the understanding necessary for purposeful employment.

To satisfy them, more and more attention will be given to two streams of education. And this goes, again, back to the AASA commentary that says that one is for future technicians and skilled tradesmen and the other is for those who will later proceed to studies in science and engineering and medicine and the liberal arts.

I'm sure there are many more developments that are going to occur, all with this one common denominator of change. Each will be aimed at serving the individual--the focal point of education--to try to get him to accept change as a challenge, to help him

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inquire, to accept, to probe and to appraise new ideas, appraise new situations and new objects. AASA adds an important point. It says that if teachers, administrators and parents want to foster in young people the desire to be daring, to be bold, to try new ways and to discover the truth, then they must set an example by daring to design buildings which exemplify and embody these aspirations. The Educational Facilities Laboratories counsels educators, architects, and citizens: Don't buy permanence at the expense of performance. We are in a period of rapid cultural change and don't saddle us with unchangeable schools that will some day sit beside the road, a ragged beggar sunning. Certainly we've seen change, we can feel change in the nature of our educational tools: teaching machines, audio-visual equipment, listening devices, microfilming, blackboard-on-wire demonstration that we've seen today.

The ferment of ideas in education affects every feature of the school from temperature control to the electronics laboratory. But for the rest of this presentation, I would like to talk about the building itself.

It seems to me that there are two basic concepts that have great implications for school building design. One is the concept of space--not just that more space is needed or that pupils and teachers can get along with less space or any kind of that dialog. Rather, the focus is on the kind of a space that can be adjusted to changing needs with minimum delay and cost. The need is for fluid space, flexible space--whatever you want to call it--space which is not restricted by tradition. The long-sought abilities to make big rooms out of little rooms, to mold interior spaces to fit the educational program are realities.

The second basic concept, and one which is rather difficult to illustrate, I'm afraid, relates to control of the total learning environment. The ability to divide and re-divide space is only one element of concern. The nature of educational change demands that the learning environment within which the student is placed must also accommodate changes in the kinds of learning activities, in the kinds of functions he is going to perform within this environment. This requires the ability to change and to control the thermal environment, the visual environment, acoustical and aesthetic environment to meet the changing needs and the changing requirements of these individual learning situations.

Now these basic concepts and the educational demands that they have placed on the physical plant have resulted in what I might call an "organic school" in an effort to differentiate. An organic school is one which grows and changes in relation to the educational demands placed upon the physical environment. A major

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thrust is toward the control and adaptability of the total learning environment. In this way, I think, it gives cognition and recognition to the school as a tool for learning.

I do have some slides of a half dozen different schools which I would like to show to you. I have not necessarily selected them to illustrate the two basic concepts, however, many of you will recognize this school as one of the very early attempts to meet and present a functional environment. This is the so-called "snail school" that was built down in St. Louis. It was designed for a particular school district, for a particular board of education at a particular point in time and with great focus on the spiral curriculum and the desires of the people that were in that district, and particularly Noel Estes. I happen to know Norman Boyles. Dr. Boyles is currently out at Iowa State. Norm was involved in the educational specifications on this particular school and it was recognized that they were focusing on a particular kind of learning environment that would be presented for the students.

In the core area we have the teacher planning area. This is the learning resource center, and there are open spaces. The kind of flexibility that is translated into this design, as I see it, is a presenting of variable size spaces. These are classrooms around the perimeter.

So that there are variable sizes and treatments . . . it's a very functional building. I recall when I first went to work with the Inland Steel Company down at the steel mill, I was responsible for the department that was a long, narrow building and I was at one end and my supervisor of employment was on the other. As they got closer to me, I had better communications with the people who were closer to me. I've often said that if I had the opportunity, I would want to place myself in the middle and then the people who work for me around. And I think that this is what John Shaver was trying to do. Because here you have your teachers, their planning center--the hub of this educational program is in the center of this school.

Let's take a look at some of these spaces. The only difficulty I have with this is that I'm not sure that it meets the second criterion that I've spelled out but that's probably because I don't really know enough about the school--and that is, how could this really be changed? Do we have control over the learning environment? There perhaps may be somebody here that knows the answer to that question because I do feel that it's important to be able to accommodate and meet changing conditions as you go through. It may be that somebody doesn't want the spiral curlicue any more and, I think, knowing the architect on

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that project, that they undoubtedly can accommodate for that change but I'm just not sure. The only reason I got this in here is to try to present this functional type of programming and design.

Now this is an illustration of the teacher planning area. It's elevated. This is the side of the teacher planning area. This is the learning resource area and open space. This is their audio-visual control center. They have excellent equipment. Again, this is some classroom space without partitioning. It's an open plan in this particular area. In another area, we have closed space but here we're showing the open plan.

A couple of shots of the theatre for group activities in an elementary school.

So, I think this was one of the very first attempts to meet the functional design of a facility and to take into account the educational requirements and the program needs of the district at that time. It certainly is architecturally pleasing, it certainly meets the aesthetic requirements without question.

Now this is another elementary school. This is DiLaviega Elementary School. I would like to read from some of the notes I had. These were taken following some conversations with the superintendent. "It was our feeling that the design of this school recognized the psychological as well as the academic implications in moving the youngsters from the sheltered environment of the home to the communal atmosphere of the primary school." They tried to provide a good balance between self-contained classrooms and the open plan. Their effort and objective was to encourage freer interaction between pupil and pupil, and between the teacher and the pupil. So, as the child moves from the relatively secure environment of the home into the school situation, he again is placed into the secure environment of the self-contained, separated kindergarten area. Then as they progress through the grades, you'll notice that these classroom pods are grouped around an open area. This is sort of an assembly court in here with the instructional areas grouped around it.

I'd like to go on to the other slide. I think I can show you a little better . . . In these classroom areas you'd have the first grade and here you have the second grade. You'll notice that not only are they grouped around this large assembly area but they've also grouped themselves around what they call a "wet area"--a wet or sloppy area where the children can get together to work on their art-craft projects, at the same time maintaining the opportunity, through the use of operable partitions, to close off this space so that you can have a self-contained classroom in each of these areas. If you think about this, what they've done is to

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make it physically possible, with the educational program, to move into this area of controlled conditions for social growth and psychological maturity. I think it's a rather interesting treatment.

Over in the other area here, as you move up into the later grades, this area doesn't become an assembly court but rather it's a learning resource center on the theory that now we've accomplished our objectives in terms of social interaction and now we want to have the children exposed to learning materials and so we'll group them around this hub of learning material centers.

Just some quick shots on this . . . This is a typical classroom scene. The use of color, I think, is very effective in this school.

This is a classroom area and here you begin to see the "wet" area or the little project area.

Here again . . . this, I think, gives you a little perspective. This is a classroom and you'll notice that there is plenty of room to have your own little individual groupings in those classrooms and, at the same time as you can see, here is the instructional spaces for the other classroom crowd areas grouped around the "wet" area.

And this is a shot of the assembly area which they're using for a musical, dramatic productions and whatever group activities are desired.

The next school--I'm sure that there are many in here who perhaps have visited the Barrington Middle School. I find it interesting for a lot of reasons. I really think it's an interesting concept in terms of education. I think they've had as many visitors there to see the educational program as they have the building. In any case, Dr. Fenley certainly expressed himself very clearly. He feels that education is most effective when the educational process is focused on the individual and his interests and his needs and his abilities. So, this kind of thing along with his concern over the transition from the self-contained classroom of the elementary grades into the departmental high school, he wanted to provide a transitional type of facility and that's the middle school and I think he's done that. And, above all, I suppose we could say that he's a firm believer in self-motivated learning. He feels and has confidence in the children that if they're provided with an opportunity to pick up these materials and to use them, just the sheer exposure and the opportunity to learn,

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that they'll get something out of it and, perhaps, be better learners. So the hub of this design is the learning center. You'll notice that with the academic wings and the kinds of relationships that exist in this learning center that it's almost impossible for the student to move anywhere in that building without going through his learning center. I think that's really the feature of that building. It has some other elements but I'll pass over them simply . . .

Here, to illustrate . . . I don't think it's complete prejudice but I would describe this as an organic school for this reason: This type of partitioning . . . I should perhaps say for some of you that this is his "traffic area." He contends that he does not have any corridor space. Each of these pods are classroom areas. The white dotted line is an operable partition so that you can have large group instruction in here, combining two classes. And that was the concept that he went into this school with. I understand that he's going to change about 30 percent of that partitioning this summer. It will be interesting to see just what he does. He has also indicated that he doesn't expect to be superintendent of Barrington forever and maybe the next superintendent who comes along won't want this kind of treatment or program. Perhaps this won't always be a middle school and the opportunities that exist here . . . you can change these partitionings. You could have a double loaded corridor with a corridor right down the middle and the traditional classrooms on either side. The configurations are changeable in terms of whatever the educational program requires but, in addition to that, . . . that's only one part of the pieces, as I indicated. In addition to that, the activities change. Perhaps you don't want this to be an academic wing any more. Perhaps you're going to have this a kind of a large lecture area, or some other kind of functional change within there. This means that you're going to change, or should change, both the thermal and the visual environment as the tasks change. And this is completely possible within this school and that's the type of thing that I've been trying to define as an "organic school" which gives you, I think, a larger capacity for change than many of the elements of the physical environment.

Some quick shots . . . This is a classroom space. This is the operable partition, remember, between the two classrooms. They do . . . This was taken during the class--it's not a posed picture. They do move out into that traffic area and use it as additional educational space.

This is a meditation center. I'm sorry the lighting isn't good enough to see that but within the learning center, within that little hub area, he's kind of partitioned off an area where the children can go. This is a quiet area so they can sit and read.

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This is the shop area, the dining and creative programming area. Notice, in the background, he eliminated his kitchen equipment and went to the vending service. It seems to work out all right for them.

This is a high school. Perhaps I could go on here to show some of the programmed relationships. In fact, I'll go one slide further. Now this is the campus plan as you can see from the layout. Now to go back to show the educational program relationships, notice here there is a social studies building, a language building. These buildings are grouped around an outside court area, but we do have the treatment of a hub area here with the library, learning resource center, assembly areas with the academic spaces grouped around that hub. In this particular school, they made fairly extensive use of audio-visual, closed circuit television and other kinds of things and in the particular building in about that location, you will find quite a production area for their closed circuit television. Within the instructional spaces, not only do we have the buildings grouped around the commons area, this court area, but within a particular department--the social sciences department, commerce department--you will notice that the instructional spaces are grouped around a departmental court. The smaller are seminar rooms, small departmental reference libraries as well as some office space and counseling areas in addition to this instructional space. Within the court there are individual study carrels and other potential for individual instruction within the departmental complex itself.

I think this is an interesting treatment of a laboratory. Forest tells me that it's getting, perhaps, more common than I thought it was, but, you notice the lecture and seminar space is joined here together. You're actually looking at two rooms. The operable partition would come down through here and you could have either a small seminar or a large group lecture activity with the science and project tables of equipment, the more fixed items of equipment on either side of the instructional space.

This is a view of one of the interior courts . . . the administrative suites . . . and I need to be reprogrammed. I have a couple of other schools and then we will move into the finish.

I suspect that some of you have had the opportunity to visit the McPherson High School, McPherson, Kansas. This is a school designed by John Shaver and I think it reflects more of the nature of an organic school than his earlier treatments because, again, he had a different concept in this design. Now, he was not being asked to design this school for this curriculum but was considering the capacity for change that I think all of us agree is here. These are some of the instructional spaces and you can see that in

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this instance, the opportunity to group and regroup is provided with operable partitions between the walls and your focal point on the lecturer coming down in this configuration.

Well, this is your science area. This is . . . in the earlier shot, we saw a separation on the side. In this instance, John has provided for his lecture situation in the front, which can be similarly divided, and the laboratory tables in the rear as we see . . . Notice here they're working at their science projects with the lecture arrangement in the front.

This is their language lab.

This is their auditorium. I understand it's very excellent. I haven't had the opportunity to be in it. . . . telling me about it last night. Apparently it's a delightful environment, acoustics are excellent as they are here and it's a very effective treatment of the stage area.

This is a music rehearsal room.

The home economics area . . . and the shop area, which looks like a grand space to me. A very delightful . . . I suppose at Barrington they'd call it a dining-creative programming area. I think the thing that I would like to state is that the kind of accommodation to change that we're talking about is not related to any geometric configuration. It's possible in all sorts of configurations. There are advantages and disadvantages to each. The important thing is to recognize that we're just not dividing space but we're controlling and accommodating to change the total learning environment.

Very quickly through here . . . This is a large loft type building. There are 3½ acres of educational space in this particular building. It's a departmentalized high school, each of these representing a department, the core treatment with your library-learning resource center again, assembly court, dining commons, with the educational space grouped around it.

Again this same type of court treatment that I described in the El Dorado school.

This is the commons area near the entrance to the building. This is the "theatron" with what they call a persenium stage. The stage can be divided on either side or open as you see it here for seating on both sides.

This is the library, the mezzanine providing space for individualized study. I think the next slide will show that the study

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carrels, all of the individual programmed learning devices and that sort of thing are on this mezzanine so that you can isolate yourself away from the traffic and large group activities on the library floor.

The drafting area . . . and again one of these interior courts with the . . . this is a departmental court treatment.

The last school in my book has the most advanced educational program. You can see what it's in--it's in a remodeled building. This is the Oakland Community College just outside of Detroit. They're using the group tutorial system in which they have large group assemblies, large lecture meetings, once a week with the master teacher. They have small assembly sessions like the old quiz section idea but with, I hope, a better teacher than some of us were at that level.

In addition to this, then, after your large group meeting and your individual discussion sessions, you move on to your own self-paced learning through the use of programmed material and devices. I asked them to send me some slides that would show the process and I didn't really appreciate that they would also show me what happens when you try to fit an educational program into an old school. I can't be against it as a taxpayer--remodeling schools--but I do believe that you can provide a better educational tool for learning if you can develop a new school. And, Vince Pollock, I'll argue that any time we talk about a middle high school or senior high school up in Arrowhead.

Here we have one of the small assembly sessions. She's checking out some of her materials. I think this is a relatively cramped, unpleasant atmosphere. I wish the lighting were better so you could see just how bad it is. The little tape cartridge--Fortunately, I'm sure their third and fourth campus is going to be completely different. This is the way out . . . the school is under construction now and I'm sure will be reflected in the design of their next school but you'll see that, again, we start with the hub of the learning resource center. This is where the educational material is present and they provide space for the groupings, for the carrels, for your small assembly treatments--so they recognize the process of education that they are involved in: the group tutorial system. It's translated into physical space in a physical learning environment.

I think, I hope, that these schools reflect some of the criteria beliefs that I hold myself and perhaps some that were presented in the AASA "Schools for America" book. For the most part, I think that they recognize that the one major trend (this is a quote) which is exerted, the greatest impact on planning new

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schools, is the growing recognition of the individual in instruction and that the good school building today has many kinds of spaces and the maximum ability to convert and reconvert spaces as the need arises. (end of quote)

This looks like a pretty ordinary classroom. I think I was on the board of education when that classroom was built. The photography is very good--I'm afraid the space isn't. That isn't why I put it there. The classroom that's long been regarded as the very core of our educational facility is feeling the impact of change from many sides. I guess I'm just as proud as I can be of the fact that in our school district freshman geography--the way that these children are learning geography is by going up in the air and taking a look at it. This is a view of some contour plowing in the area up around Fond du Lac. You all recognize that. There were a lot better educational sides but I thought you'd all like to see something that was familiar--Holy Hill.

These children are being taken out of the classroom, put into an experiential environment, where I think we all know from our own lives that learning really takes place. As the kind and amount of information increases and teachers and administrators devise new ways to help the kids learn more, to learn it faster and better, the traditional classroom is feeling these tugs of change. To meet the challenge of changing curriculum and methods, the tension is focused on flexibility in the use of space and the capacity to adapt and modify this total learning environment. The task of building a school has never been an easy one. The task facing today's school planners is probably more complex than it has ever been before. It isn't easy to provide effectively for the boundless enthusiasm of youth. There is no single sure blueprint to provide channels for the curiosity of the young, growing mind. There is no way to provide a multi-program curriculum to meet the needs of all children. I think this should be a beckoning challenge to all of us. Physical facilities must reflect this challenge. The broad and rapid changes are occurring in our time and the potential for change in the future promises to exceed anything of that in the past that we've experienced. I don't think there is a one of us in this room that doesn't look to education to be the key to the life in a free democratic society and the home of education is the school. To plan for it, to design it, to build it, and to make it function effectively is a challenge and an opportunity for all those who are involved in planning schools for tomorrow today--and for this old fellow, the focal point of education. Thank you.

This speech was given at the School Facilities Planning Conference held at Wisconsin State University, Whitewater, on June 14, 1967.

PANEL REACTION
Mr. A. L. Buechner

Thank you, Mr. Zastrow.

Interested audience! I'm sure you're interested or you would no longer be here.

You noticed how easily they maneuvered me into the middle. This is the position that I'm come to be known to occupy, but these two individuals that remain seated . . . carry the brunt in the decisions today in education. We hear much about the change that must take place. We see it in pictures and it's very nice to be home. I enjoy very much participating in meetings of this kind yet, at the same time, I leave quite often with the feeling of inadequacy that I may not have had when I came. I leave with a feeling of frustration and I think part of this is due . . . the more practical aspects of introducing some of these changes in our educational system is the reason. The practical aspects tear us in that it is rather difficult to move through the district electorate, educate them to a point where they, too, understand the need for it. Through a school board, elected by these people in many cases, and with the leadership of your district administrator, he is to provide the answers. How may these innovations--not necessarily always innovations--but how may modern education proceed in our school district and meet its needs, meet the total challenge? And this is no easy task. I submit that it would be most difficult for anyone here in this audience, or possibly in the state, or possibly the nation, to plan a building--today--that they could assuredly say will satisfy the needs 25 years from now. This is ridiculous. It cannot be done, it has not been done. What we can do is plan a building that will get out of the way in the future so that change may take place. And we do this by providing (1) adequate sites well in advance of their actual need; and (2) we do it by planning educationally as to what we're to house. I realize that we quite often refer, and it's easy to say, that form follows function. That should be true most of the time--not necessarily always so. I know situations . . . we continue to highlight some where form leads function, form distorts function. And this is easy to do. We use a catch term. The general public likes this: hexagonal, drum shaped, name it--all kinds of shapes. They take you all out of shape. We do these things very easily. The public is impressed that here we have designed modern education, but the same thing happens inside. Now, educational change will have to come through an informed public and that's the only way it's going to be introduced practically and realistically. It's introduced and brought right into focus by the two individuals that are the balance of the panel. Theirs is the most important job.

To design a school building is the simplest thing that you'll ever do. Don't let anybody ever think that it's tough. It isn't.

PANEL REACTION--Mr. A. L. Buechner--2

But to design an educational program, to convince the school district that this is the kind of offering that they need and that this is the kind of money that they should invest (you notice I did not say "spend." I said "invest.") in it is the real task. This is where we need the help. We no longer need a lot of questions. We need answers and these answers have to be forthcoming somewhere as we work in the area of educational planning. And you note again, I did not say "school building planning." I said "educational planning." This is the important area, this is the area that's overlooked.

Now how are you going to do this. I suggest that we bring the parents into the school. This isn't a matter of adult education. This is something entirely different. This is educating people as to what their children need and are getting in our schools today. They don't know and they won't come to look. I believe the shadow program would be the answer--allow these parents to move right into the schools--schedule it in such a way. They need at least to know the type of equipment you have, how you use it, how their youngsters . . . They no longer bear any relationship in education with their youngsters in school today. Their point of reference in education may still be comparatively recent and yet they cannot understand each other, they cannot communicate.

I shouldn't risk telling a joke. After all, you had the master telling them this morning but in this matter of communication--lack of communication--I can't resist. I'm pretty sure some of you may have heard it. This relates to a Norwegian trader loaded very heavily with a very fragile, perishable cargo. As they were moving into the port for unloading, they had to move into some rather difficult, torturous, narrow fjords in Norway. As a result, it's customary for the skipper to ring the bell to signal that he's moving into the fjord which will bring a guide and a small boat to guide him in through the narrow channel. In this particular case, no guide responded to the signal. It was tolled once, twice, a third time. Still no response. Finally, the skipper moved to shore in a small boat to try to rouse someone. He found no one. The third or fourth place, he finally found an older woman and he asked where everyone was and she said, "They're all sick." And he said, "How am I going to get this ship to shore?" She said, "I don't know." He said, "Do you happen to know this coast? Do you know this rocky channel?" "Yah, sure," she said, "I know every rock." "Oh," he said, "that's fine. Come on." They loaded her in the boat, they took her on ship. She was told that she was to direct this ship to shore. She knew where the rocks were. The skipper went down below to relieve himself and to relax and no sooner had he placed himself in a chair and, with a crunching noise, they were on the rocks. So he rushed up above livid with

PANEL REACTION--Mr. A. L. Buechner--3

rage, accosted the woman and said, "I thought you knew where every rock in this channel was." She said, "Yah, I do. That's the very first one."

We fail to communicate . . . it's simple . . . but we still must sell education. Sell education might not be the right word. We shouldn't have to sell education. We certainly shouldn't spend for education. Convince people to invest. Then when you do, talk about the new buildings. This is wonderful. I wish it were possible in Wisconsin and probably in the nation to replace every single old building that we have. Yesterday I had the opportunity of visiting 13 of them in one day in one community. The primary purpose of my being there? To assist as far as possible in determining those minimum things that might be done to assure the safety, the physical safety, of the youngsters if that building were to be occupied for another 10, 15 years as it probably will be. Do you know the best environment that I saw yesterday? I like to refer to this thing of controlled educational environment--see it. This is the only way we can see it. I saw a room for mentally handicapped youngsters in a partial basement room. That was the finest educational environment that I saw my entire trip. Why was it? First of all, this teacher was working with a small number of students. Individual instruction is a must in this particular operation and it works. She is not expected to work with 30 students or 25. The floor was carpeted and the only reason it was carpeted was because it was in such bad shape, I'm sure, that they had to put some kind of a covering over it. This was the only room where I saw flowers--flowers. I don't care if they were plastic in some cases. We need real flowers in many cases but plastic will do for the color. Kids love color. In fact, if we allow kids to help in the design of school buildings, I think we would do a better job in some cases than we do presently. I think they will recognize some of the things that we want that we do not know. This was the finest environment I saw in this particular building.

I promised these fellows I wouldn't talk more than three to five minutes and that's going to be it.

I still feel that in terminology alone, we can be a tremendous change agent. We can be--in change. As I said before, we refer too often to the matter of spending and people, in thinking of spending, think of something else besides education. They should if they don't. "Invest" is the word. That's what a banker would use--the fellow with the gleam in his eye. I've got a gleam in my eye today, too. I see some of you fellows with hair on your head, and the ladies with hair on your head. This is a lot tougher for you today than it is for me.

PANEL REACTION--Mr. A. L. Buechner--4

We use another term so commonly and this is the proper term when I consider the environment in which it's used: Feed. We feed children. I don't know . . . we do feed them, but I've seen some areas that I would call dining areas, some areas that would be lunch . . . We use another term that tears us down: Haul. We haul children. We transport children.

These are small things but, overall, they can be very meaningful; and, above all, we need to get people into our school buildings. They need to understand that the most important thing isn't always the building. We're going to have these older buildings and, in spite of everything we'd like to do, we're going to have to renovate them and we're going to have to adapt them as best we can to a modern educational program. There isn't a district in this state with multiple buildings serving the same learning level that is going to find it possible to continue to operate in an old core center, in an old building, and, at the same time, offer to some of the newer and expanding areas of greater cost these newer facilities that presumably will do such an outstanding job in education.

I'm just going to close right on that.

This speech was given at the School Facilities Planning Conference held at Wisconsin State University, Whitewater, on June 14, 1967.

PANEL REACTION
Mr. A. E. Haller

Thank you for referring to the non-professional.

As I listened all day, more and more I began to realize that I represent, probably, the only non-professional in the entire educational system . . . because . . . as we do our negotiations, that's one of the functions of the school board now that is very new to some of us--we even negotiate with professional janitors. So the only non-professional left, apparently, is the school board member who, supposedly, is the policy-making body. As I understood it, as it was explained to me as I became acquainted with my responsibilities as a school board member--we set policies. In other words, as I understood it, everything centers around the school board. We make all the decisions and, believe me, many and most of the school board members feel this pretty strongly. And most of us feel pretty inadequate a good many of the times. I listened all day to the very able professionals and I am very happy I had the chance and I only wish that many other board members had the same opportunity.

It just so happens that I'm right in a business very closely connected with education but I think if some of my other fellow board members, even in my own group, would listen to a discussion of loft schools and electric blackboards, audio-tutorial machines, teaching systems, programs--somewhere somebody has to make a decision. And in the end it comes to us. And yet, at the same time, the responsibility for convincing the public. I'm agreed with you that we don't want to use the word "sell," but we need help--we need help--to convince the public that this is what they need.

At one time school boards apparently were accepted as a kind of mirror for the public. We were supposed to reflect our community. That might have been fine when everyone had the same eighth grade education but what can you mirror on your community now? Its a pretty complex bunch of people. Unless you happen to be in, say for example, a rather affluent suburb where maybe 80 or 90 percent of your people are college graduates, then perhaps the . . . the enthusiasm for education, that everybody wants to pay for it--that I heard this morning--maybe that's true in some communities. But I don't find this true everywhere and we need help! We need help from you people, we need help from everyone connected with education in any way! I cross the various areas in education because of the nature of what I do and I see a tremendous number of industries and occupations and everything else connected with education, but how many are really promoting--are really encouraging--it with the public. I don't sometimes see all that enthusiasm for education with the increasing percentage of dropouts. That is apparently a problem everywhere, even in small communities and I

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don't see any sudden and abrupt change on this. What bothers me, personally, and I know it bothers most of the board members that I talk to and meet at conventions and elsewhere, is the term "good education." By God, we want it! But nobody seems to be able to tell us what it is--nor did I hear it today. I know good education means that our kids are learning more than I knew, only better. I don't know if that's good or bad. What is good education? Does this mean more information so that he can get a better job when he finishes vocational training? Is good education preparing him for the rat race competition that he has to have to get into college? I don't know if that's good education but that's what I see happening with curriculums and everything else. We talk about adding something to the curriculum--like in our history course--and somebody says, "Oh, we can't get that in. We gotta have this instead because he's gotta have it to get to college." So we, as school board members, are asking and I haven't heard the answer yet about what good education is. I am anxious for it. We all are very anxious for it. I am inclined to agree with the statement this morning that the 30 percent factory and 70 percent tools and education, as I see it, is rapidly making that switch--at the rate that teachers' incomes are going up--as maybe they ought to, if the quality of the teachers goes up along with it. And I don't see that happening very fast.

What's happening? What happened to good education 20 years ago? What happened to it 10 years ago? Why are we having an increasing juvenile delinquency rate? Why is the increase in crime rate the highest with the youngsters? Oh, we can find the answers--we can point to the parents, we can point to TV, we can point to . . . what . . . our culture, I hear. Our society is changing. Where does education fit in here? I hear defenses. Well, the parent is abdicating his responsibility, the family is changing. Well, all right. Somebody's going to have to take up the slack. Is this part of good education? I didn't hear that much about it today.

I'm a little concerned about the strong emphasis--of course, this is probably what the reason for the conference was today--on hardware, on buildings--we've got to have the buildings, there's no question about it. But at one time I remember hearing about the boy at one end of the log and a teacher on the other and this was all that you really needed as I understood the philosophy expressed the best teacher and individualized instruction. They tell me that you can do this electronically, that individualized instruction. The answer here is programmed instruction, audio-tutorial machines, the student identifies with the machine much closer than he does with the teacher in a group of 30 students. I'm agreed to 30 . . . we feel we're progressive--we went to 25. I see an immense amount

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of money going into research for new equipment. I see an immense amount of money is going into research for hardware and equipment. Boy, it's hard to find some big money and a lot of money being spent in actual learning and teaching. What is good learning and what is good teaching? I feel I represent a few people in this anyway because I do talk to as many educators as I possibly can, as many school board members as I can, but we come back to the comment made again this morning. When you're putting up a new building in your district, all of a sudden the district's full of experts. He wants this kind of a building--my aunt in Chicago, Illinois, has got this kind of a building--you gotta have that kind . . . everybody's an expert. Man! You get experts! And, as a matter of fact, school boards say, "Well, now let's be sure to discuss this with our staff." And I hear comments say, "Well, look out for that because she may have a particular thing she likes and you're going to end up with a setup, and when she leaves, there will be a mistake." But, then, what I was gathering here today was the plethora of experts within education. I made a note here--Barrington has an expert. I like what he says and I'd like to see what he does . . . very impressed, and I see an expert designing a snail school. That looked very good to me, too. But, boy, there's a lot of experts in education, and, after all, I'm just a little ole board member--I only have to make the final decision! And I talk to all the experts I can find. I get concerned because our school district made the single largest decision in terms of investment for a new school building--a million and a half bucks--and we were determined to do this thing right and the board made about a three-month study--toured all over this state and in Illinois. We looked at buildings . . . ugh-h-h! I got them all confused in the end but I remember seeing fads (as we termed it--it wasn't very professional language but it was fads as we saw it). Progressive education--that term came up a number of times. I saw building after building with glass walls and then I asked the superintendent, "How much did you spend for the draperies?" because he couldn't use it without visual aids . . . building. After all, the room is a teaching situation and you've got to have visual aids. He spent more for the drapes than he did for the furniture in the room. I'm sure this has changed. A fad? I'm sure I--at least we--considered it a fad--our small group did.

So, what I'm getting down to is how does the school board make its decision? Whether it's on the local level or on a national level-- Maybe some day this will be directed from elsewhere, but you're going to live with local school boards for quite a while, I think. As education becomes more sophisticated, we, as the school board, are going to need all the help we can possibly get together. Not only from the standpoint of expertise in the mechanics of the thing but we're going to need help to sell

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it . . . the public to invest in the idea. I see some few warning flags going up here and there about resistance to the overwhelming investments and changes coming in education. I'm sure you're all horrified at this school district that just simply refused funds and shut down the school. Good heavens! I'm glad I don't live in that part of the world but there are enough of these around, I think, to warn all of us in education that . . . let us be carried away with our own enthusiasm (as I know I do once in a while). Let's try to communicate to the public because I see parents now, college graduates of--what?--eight years ago and they can't begin to work with their youngsters in their new math problems.

So, again, as we mentioned here before, the matter of communications to the public will be ever-increasing in need--much more than it ever was before. We, on the school boards, feel this increasingly and it's coming along faster than I ever expected. So, I think the education industry--or whatever you want to call it--is going to have to contribute this information to the public in every way possible or you will find a growing resistance as the thing becomes more sophisticated. As the public understands less and less, they're bound to put up resistance. So I'm asking, as a board member, give us all the help you can. Thank you.

This speech was given at the School Facilities Planning Conference held at Wisconsin State University, Whitewater, on June 14, 1967.

PANEL REACTION
Mr. R. G. Hein

I'm the only man without any notes so I don't have much to say. This is the first time I've talked without notes for quite some time but I won't keep you very long.

Al gave you a few things to think about when he talks about investments and he talks about bringing the parents into the school. If you want to find out if you've made any progress since the last building you built, just bring the parents in that saw the other building and leave them alone. They'll tell you exactly the progress that you've made. This is the best thing that you can do, Al. I think it's very worthwhile.

The president of the board wants to know . . . the boards-- they just make decisions. I can tell him how he makes decisions. On most of the things I recommend, just vote "yes."

As you go to these meetings and see Mr. Gallenbeck's pictures and you listen to gentlemen talk about schools--about today's schools for tomorrow--you gotta build them today for tomorrow--you might become panicked and think that change is something that happens between today and tomorrow. This is not change. Change happens over a long period of time. I go to a building meeting or I go to a curriculum meeting and they all say, "We've got to educate the kids for tomorrow's world." Well, the people never were educated in the world they're living in. Did you ever think of that? Johnson was never educated in today's world nor was he educated for tomorrow's world. This is a pretty tough thing to do. We talk about this like we can always do it and we sometimes think we can build buildings for tomorrow. Oh, no. We can build buildings to implement part of the change that in its entire spectrum will help us go where we're going to go but we're going to go gradually. Now I'm a firm believer in this. In order to implement this, I want to tell you exactly how I think architects and school people can work together, and that's the board and the community and the school people--it's everybody. But there is always this element, you know. There was a farmer who was plowing in the field and the ag teacher came past and introduced himself, "I'm the new ag teacher. We're going to open an adult education course in soils next Monday night. Would you like to come?" He said, "No." "Well," he said, "wouldn't you like to learn how to farm better than you're farming?" He said, "No, because I'm not farming as well as I know how yet."

Every day I'm sure I'm not farming as well as I know how and we go to these meetings and this puts the rabbit farther in front of the dog--which is all right.

PANEL REACTION--Mr. R. G. Hein--2

Now I'm going to tell you just what I think you can do--architects and school people--to build buildings better than we built them yesterday. First of all, we have to be a team. The architect has his knowledge and his duties and the school board table and all it involves has its job and its duties. For goodness sake don't listen to school administrators and architects--I'll include myself in this.

What is good education? When I talk about Waukesha schools, that's the best, and this is true of almost everybody else. But if this team wants to build a better school, then I think it should say, "I think they're doing a good job of electronics at School X" and go and look at electronics at School X--not everything at School X but electronics at School X. Now the fellow to talk to is the teacher--when nobody else is there. When I go on these visits--oh, I go with a group--but I always come back. I talk to the teacher alone. I've done this in team teaching and I've learned the most interesting things.

We talk about big groups--big group instruction. I hope you're not giving a new name to the old lecture program because I'm afraid that the innovations we're talking about today are not really some we're going to be proud of. I can see some value in big group instruction but if this means the old lecture and the old quiz section that they had when I was a freshman at the university, they can have it. I don't think it's any better now than it was then.

But let's talk about the team. I think the architect has a certain know-how. Now there are some architects that don't want school people to tell them anything. I think you're wrong. There are some who say, "I'm an educational architect and I know about this and you tell me what you need and I'll design the school." There are school people who say, "You're the architect. We want a school that costs a million dollars. (I think you talked about--somebody talked about this.) And so give us a school for a million dollars." This is the wrong approach, too. Actually, we should take two years to plan a school--more if we can--but very few of us can. There are certain things that look awfully good on a drawing. It's symmetrical, it looks nice and if the architects want to pick me apart, they can. I'll be glad to talk to them tomorrow--not today. But the trouble with an architect--he's never lived in the building. Now to me, the proper team approach is when the building is done, when the building has been used for a year, the architect and the school people then get together and talk about the weaknesses and the strengths of this building--really evaluate it, make the architect live in the building. I'm reminded of the building that some in this room know about. There

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are certain openings in the area above the entrance--look just wonderful on a drawing but they looked like heck after the pigeons roosted in them.

Now you see, a trip back to the building tells you this. It tells you how things function that function well on paper and when the salesmen talk to you about it. And just remember--the building is not a failure if it doesn't incorporate everything that has been shown to you today or a year ago or two years ago. You cannot do everything but you can do something and I think here is where we make the contribution. In every building that we do, we try to do something different. Many of us have opportunities to do quite a bit. But I have learned this: You can do many things on paper but if your teachers are not ready to go, you don't have a program. I don't care what kind of a building you have.

So this, again, is a gradual thing of change and the people who have to do with the educating of teachers--future teachers--I think they've got to change. I think that teachers must come on the job knowing more than we know in the community schools and not knowing as much or less. I ask people I interview for jobs, "What would you do different than you saw done in elementary schools, high schools, or college?" This is an awfully hard question for them to answer because, you see, we suffer from an occupational disease. We sit in the classroom for sixteen years. Then we're teachers and we just sit in the same classroom but we sit in a different chair in a different part of the room.

So there must be other things to go with it. The schools, locally, can do some of the changes but they cannot do all the changes. Let's take the pod. I would like to build a pod but I would like to be sure that I have teachers that know how to work in a pod. I don't. I've never taught in that situation. I'd like to find teachers who can teach and who can do their best when there are other adults in the room rather than do their best when the door is closed and they're in that one room. This we must have and I think in our buildings--we must make changes in all of our buildings.

Let's take the technical area. Certainly a shop of ten years ago is not the shop of today and I don't think we're building very many shops that are of the vintage of ten years ago. I think we're doing quite well in that area. Maybe we aren't in shapes but I think we're even doing all right in shapes.

So I would say to you that I think we are doing pretty well. We went into a room, into a school--a very nice school. We were investigating folding doors--how easily did they open, how sound-proof were they--because we had two competitive bids. We said to

PANEL REACTION--Mr. R. G. Hein--4

the teacher, "Are these doors easy to open and close?" "I wouldn't know," she said. "I never opened them."

Well, this building might look fine--or any building might look fine that has all these things. It has moveable walls, it has moveable partitions--but is it actually used. Now it isn't enough to build it. So we have to build . . . this change is gradual. Let's do something. We can't do everything but let's do something. Let's make those changes that we can absorb and that we can have the kids profit from and then every year they're going to be better. This is change. Change is gradual. Sure it's been rapid in our lifetime but it's still a gradual process. It isn't today it's one thing and tomorrow the same thing is old fashioned.

So I would say to you, form a good team with your architect. Have an understanding with your architect--what his job is and what your job is--and if he resents the fact that you make suggestions, tell him you can hire somebody else. You really don't have to have him. You can find another architect. And this isn't anything against him. But they have certain skills that you must listen to. You should have educational ideas but they should have other ideas. They have materials, they know the new things in materials. They try to keep up to date on those things so between the two teams, I think many things can be done and I think everything should go across the board table--not that the board has to do the work but I think the board has to be apprised of it. And I'd like to say one more thing: A committee of any kind is not necessarily the answer to building modern school buildings. If you bring with the committee a lot of ideas, it's fine. But if you compound the ignorance of one or more people by forming a committee, you're not necessarily doing very much. Just remember this: Once you ask a person a question and he says, "no," you're in trouble if you don't agree. So be sure that when you work out any method of using the talent in your community that you're ready to take what's indicated, you're ready to challenge, and that insist that this school should have something that the other school didn't have. Sometimes this is difficult, sometimes you have to carry people on your staff and sometimes they have to carry you.

So I would give you hope--if I'm the last one on this program, I want to give you hope. You don't have to do everything but you can do something.

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